Roaring Fork Transportation Authority
Railroad Right-of-Way Corridor

ACCESS CONTROL PLAN

RFTA ACCESS CONTROL PLAN UPDATE

January 11, 2018, Revised- February 9, 2023

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VII. Appendices: Except for those that must be approved by the RFTA Board due to contract or agreement, the Appendices are advisory or informational and non-binding and can be revised and/or updated as needed without RFTA Board action:

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Appendix D – Relevant RFRHA and RFTA Agreements Pertaining to the Rio Grande Railroad Corridor

Appendix E – RFTA Responses to Comments Received on the Proposed Access Control Plan Update

Hyperlinks to access copies of the Historic Documentation Related to the Acquisition and Management of the Corridor:

- **1994 – IGA to form the Roaring Fork Railroad Holding Authority (RFRHA)**
  https://www.rfta.com/wp-content/uploads/2018/01/1994-12-31-iga-to-acquire-the-aspen-branch-amended.pdf
- **1996 – Southern Pacific (SPTC) & RFRHA Purchase & Sale Agreement**
  https://www.rfta.com/wp-content/uploads/2018/01/1996-sp_rfrha-purchase-and-sale-agreement-aspen-branch.pdf
- **1997 – Pitkin County Rio Grande Trail Easement**
  https://www.rfta.com/wp-content/uploads/2018/01/1997-03-05-pitco-trail-easement.pdf
- **1997 – Department of Transportation (DOT) – IGA - $3M Contribution**
  https://www.rfta.com/wp-content/uploads/2018/01/1997-06-20-cdot-iga-3m-contribution.pdf
- **1997 - Great Outdoors Colorado (GOCO) $2M Grant to RFRHA**
  https://www.rfta.com/wp-content/uploads/2018/01/1997-06-27-goco-legacy-grant-agreement.pdf
- **1997 - SPTC/D&RGW to RFRHA – Shared Use & Pedestrian Walkway Agreement**
  https://www.rfta.com/wp-content/uploads/2018/01/1997-06-28-shared-use-and-pedestrian-walkway-agreement.pdf
- **1997 – First Amended and Restated IGA Regarding the RFRHA Structure**
  https://www.rfta.com/wp-content/uploads/2018/01/1997-06-30-first-amended-and-restated-intergovernmental-agreement.pdf
- **2000 – Comprehensive Plan**
  https://www.rfta.com/wp-content/uploads/2018/01/2000-comprehensive-plan-complete.pdf
- **2000 – IGA providing for the Creation of the Roaring Fork Transportation Authority (RFTA)**
  https://www.rfta.com/wp-content/uploads/2018/01/2000-09-12-iga-providing-for-the-creation-of-the-roaring-fork-transportation-authority.pdf
- **2000 – RFTA Formation IGA**
  https://www.rfta.com/wp-content/uploads/2018/01/2000-09-12-rfta-formation-iga.pdf

- **2001 – Amendment to GOCO Legacy Grant**
  https://www.rfta.com/wp-content/uploads/2018/01/2001-01-03-amendment-to-goco-legacy-grant.pdf
- **2004 – STB Decision – RFTA Right to Reactivate Rail Service**
  https://www.rfta.com/wp-content/uploads/2018/01/2004-08-16-stb-decsion-rfta-right-to-reactivate-rail.pdf
- **2005 – Comprehensive Plan**
  https://www.rfta.com/wp-content/uploads/2018/01/2005-comprehensive-plan-complete.pdf

I. OVERVIEW

This document contains the Access Control Plan ("ACP") for the historic Aspen Branch of the Denver & Rio Grande Western Railroad Corridor between Glenwood Springs and Woody Creek, Colorado (hereinafter the terms "Corridor", "Railroad", "Railroad Corridor", "Rail Trail", "Right-of-Way" ("ROW)", and "Property", all refer to the above noted Aspen Branch of the Denver & Rio Grande Western Railroad, are one and the same and used interchangeably throughout this document) as now owned by the Roaring Fork Transportation Authority ("RFTA"). The ACP applies to the entirety of RFTA's ownership area. The ownership area is approximately 33.4 miles in length and the width of the property varies from 50' to 200' with the predominant width of 100' covering approximately 460 acres of land.

The Roaring Fork Railroad Holding Authority ("RFRHA") acquired the Railroad Corridor in 1997 as an operating line of railroad pursuant to authority granted by the Surface Transportation Board ("STB"). RFRHA subsequently "railbanked" the line, which preserved it for future freight rail reactivation and allowed the Corridor to be used in the interim as a public trail and for open space purposes. Pursuant to 16 U.S.C. 1247(d), a "Notice of Interim Trail Use" ("NITU") was issued to RFRHA by the STB in 1998. RFRHA transferred ownership of the corridor to the RFTA in 2001 pursuant to a NITU substituting RFTA for RFRHA as the railbanking entity. The residual common carrier obligation and the right to reactivate rail service was also transferred to RFTA pursuant to a 2004 STB order. The ACP is adopted to define the responsibilities and expectations of the sponsors of projects proposed to cross or encroach upon the Corridor, and to ensure reasonable access to the Railroad Corridor consistent with the Corridor's interim trail, open space, and other lawful public uses, including possible freight rail reactivation and/or commuter rail use.

RFTA's intent is to facilitate the interim use of the Corridor for a public trail, open space, and other lawful uses and to enable reasonable access to and crossing of the Railroad Corridor, while preserving the Corridor's railbanked status for future commuter and/or freight rail service. The ACP takes into consideration the interests of RFTA's constituent-members as well as private property owners and allows for reasonable, planned access into and across the Corridor in keeping with this ACP and RFTA's Design Guidelines ("DG"). It is not the RFTA's intent, by this document, to interfere with any constituent member or other local governments land use, control or authority over private or public development other than to protect and preserve RFTA's rights and obligations to the corridor. Insofar as necessary to ensure RFTA's obligations for the Railroad Corridor related to its railbanked status, this ACP includes an explanation of "railbanking" and the requirements necessary to maintain that status.

The ACP also includes a brief summary outlining the obligations related to use of the Great Outdoors Colorado ("GOCO") funding, and a brief summary of key findings of the Recreational Trails Plan.

II. BACKGROUND

Train operations in the Roaring Fork Valley decreased in phases between the 1960s and the mid-1990s. Recognizing its potential value as a future public transportation corridor, RFRHA was created in 1994 by means of an Intergovernmental Agreement between the City of Glenwood Springs, Garfield County, Town of Carbondale, Eagle County, Town of Basalt, Town of Snowmass Village, Pitkin County, the City of Aspen and the Colorado Transportation Commission, for the express purpose of acquiring the Aspen Branch of the Denver & Rio Grande Western Railroad Right-of-Way (33.4 miles from Woody Creek to Glenwood Springs) from the Southern Pacific Transportation Company. In 1997, RFRHA purchased the corridor for $8.5 million funded by a consortium of state and local interests, including RFRHA's members, the Pitkin County Open Space and Trails Program, the Colorado Department of Transportation ("CDOT"), and GOCO.

State of Colorado Rural Transportation Authority enabling legislation, enacted in 1997, (i.e. 43-4-601 et. seq., now known as the Regional Transportation Authority Law), was the impetus for creating a more effective regional transportation authority structure. In November 2000, voters in Glenwood Springs, Carbondale, Eagle County, Basalt, Snowmass Village, Pitkin County, and Aspen approved the creation of RFTA, the successor to the Roaring Fork Transit Agency, and dedicated sales taxes to support the ongoing operation and development of transit and trails programs. Subsequently, over the next two years, the employees and assets of the Transit Agency and RFRHA were merged into RFTA. Currently, RFTA manages the Corridor and is preserving it for future rail/transportation purposes pursuant to the federal railbanking provision of the National Trails System Act, thus limiting activities that might preclude re-introduction of rail or other mass transportation systems in the Roaring Fork Valley. The interim use is an extremely popular 10' wide paved trail, known as the Rio Grande Trail (RGT), from Glenwood Springs to Woody Creek. A paved and soft surface trail, owned by Pitkin County, connects Woody Creek with Aspen.

The Corridor, bounded by approximately 500 adjacent private property owners, traverses three municipalities and three counties, and it is encumbered by multiple licenses, leases, contracts, or easements. It is the intent of RFTA by means of this ACP to address the reasonable access needs of RFTA constituent-members in a cooperative fashion while protecting the Corridor and fulfilling RFTA's regulatory and other contractual obligations given the best information and legal precedent now available.

RAILBANKING

Under 16 U.S.C. 1247(d), Congress acted to encourage interim uses of otherwise-to-be abandoned railroad lines for trail and other compatible public purposes while preserving the potential future use of such railroad lines for freight and other consistent commuter or passenger rail uses. As such, Railbanking provides a mechanism that allows RFTA and local jurisdictions to maintain the Rio Grande Railroad Corridor for alternative public uses, while preserving the contiguous 33.4-mile Railroad Corridor intact, so long as the Corridor is maintained in a manner allowing for future freight rail use.

An underlying concern is the interests of individual property owners along the Railroad Corridor, who maintain property interests subservient to the Corridor's Railbanked status. In 2014, the Supreme Court of the United States ruled that federally granted Rights-of-Way that comprise many of the nation's railroad corridors may revert to adjacent property owners upon STB approved abandonment and the consummation of that abandonment authority. If the Corridor was removed from Railbanked status and RFTA exercised its underlying abandonment authority through consummation of the abandonment, then the Corridor would no longer be subject to STB jurisdiction and approximately seven miles of Federal Land Grant areas could revert to adjacent property owners. This would render the Corridor unsuitable for a future public transportation system, and also negatively impact the existing recreational trail. In order to ensure compliance with 16 U.S.C. 1247(d) and preserve the Corridor's Railbanked status, any agreement, crossing, or interim use of the established Corridor must be constructed and maintained in a manner that would allow for the right to restore and reactivate freight rail service and would not preclude or permanently interfere with the restoration and reconstruction of the Corridor for freight railroad purposes. This is necessary to avoid any potential determination that the corridor has been abandoned. Regulatory and interpretive guidelines create conditions to which proposed uses (including crossings) of the Corridor should adhere. In most instances, compatibility with freight rail will also ensure compatibility with possible future commuter rail use, as well as current and future trail uses. However, compatibility with trail uses does not necessarily mean that a proposed use or crossing is compatible with freight rail reactivation or future commuter rail uses. For this reason, parties seeking to use the Corridor for crossings or other purposes are encouraged, while in the early planning stages, to consider whether their proposed crossings or other uses are compatible with freight rail reactivation and commuter rail uses before they file an application for such uses with RFTA.

III. RFTA PHILOSOPHY REGARDING PROPOSED PUBLIC AND PRIVATE CROSSINGS AND OTHER USES OF THE RAIL CORRIDOR

This ACP and the accompanying DG are intended to guide sponsors of crossing projects and other uses of the Corridor, from the outset of their planning processes, on the design of their projects in ways that will not create concerns for RFTA with respect to future freight rail reactivation or commuter rail uses. Subject to CPUC approval, and while rail service is inactive on the Corridor, RFTA will generally approve public at-grade crossings that meet its DG, so long as such crossings would not preclude or permanently interfere with RFTA's ability to reactivate freight rail or initiate commuter rail service.

RFTA recognizes and appreciates that the constituent governments of RFRHA, from whom RFTA inherited the Corridor, are also members of RFTA and that they, too, are committed to preserving the contiguous Railroad Corridor intact for its future and current uses. For this reason, RFTA agrees that it will not withhold approval of proposed public crossings and other Corridor uses that are consistent with RFTA's ACP and DG and would not preclude or permanently interfere with RFTA's ability to reactivate freight or initiate commuter rail service. However, the corridor is subject to obligations associated with CDOT, Federal Highways Administration ("FHWA"), GOCO, and Land and Water Conservation Funding ("LWCF") 6(f) designation grants involved in its acquisition and the construction of the recreational trail, which may require consultation with these agencies for certain actions involving the corridor.

RFTA acknowledges that no plans, policies, or guidelines, can foresee every condition or situation that could potentially arise with respect to all proposed future uses of the Corridor. RFTA intends that its application of the ACP and DG will be flexible enough to adapt to the unique circumstance presented by Corridor uses that are proposed in the future. RFTA will also endeavor to use a reasonable approach when working with crossing sponsors to help them design their projects to be cost-effective, so long as in the absolute discretion of RFTA, its legal counsel, and railroad engineers, the preservation of the Corridor's Railbanked status would not be jeopardized.

RFTA assures parties proposing public or private uses of the corridor that it will endeavor to work cooperatively with them, consistent with the policies stated herein, to help them achieve their objectives in the most efficient and cost-effective manner possible, including collaborating with sponsors during the planning and design processes for their projects.

IV. GREAT OUTDOORS COLORADO (GOCO)

On June 30, 1997, RFRHA, a public entity created in 1993 by the towns and counties within the Roaring Fork Valley, purchased the Aspen Branch of the Denver & Rio Grande Western Railroad Right-of-Way from the Southern Pacific Transportation Company. The purchase was funded by a consortium of state and local interests. In exchange for financial participation of the property using some funding from GOCO, each of the funding participants agreed to the placement of a Conservation Easement on the Corridor to protect the "conservation values" of the property.

The conservation covenants of the Conservation Easement required that no new structures, fences, crossings, or pavement be placed, or that any mining or harvesting of timber occurs on the Corridor. The Aspen Valley Land Trust ("AVLT") was designated as the steward of the Conservation Easement and was responsible for correcting any of the violations to the satisfaction of GOCO.

On February 3, 2000, a Comprehensive Plan for the Railroad Corridor was adopted by the then RFRHA. One of the recommendations of the plan was to reduce the size and scope of the Conservation Easement on the Corridor. The plan cited that upon careful inspection and assessment of the Corridor through the Corridor Investment Study ("CIS") process, many portions did not contain the attributes described as "conservation values" by the Conservation Easement. As such, these portions of the Corridor did not warrant protection under the Conservation Easement. In addition to the reduction of the size of the conservation areas, RFRHA received strong advice from a member of its federal legislative contingent that a conservation easement on the Corridor would significantly hinder RFRHA's ability to receive federal funding participation for future transportation improvements. In response to this issue, the Comprehensive Plan did the following:

A. It changed the Conservation Easement to a Restrictive Covenant. The covenant on the deed of the property requires the owner to abide by its terms through self-regulation. (This is different from the previous conservation easement, which was an encumbrance that ran with the land and required an entity other than the owner to regulate compliance.)

B. It reduced the size of the area covered by the restrictive covenant to encompass only those areas of the Corridor that contain the "conservation values" described within the

original conservation easement. The size was reduced from 33.4 miles (the full length of the Corridor from Glenwood Springs to Woody Creek) to 17.3 miles (slightly more than one-half of the Railroad Corridor).

On January 17, 2001, an Agreement was reached between RFRHA and GOCO that replaced the Conservation Easement with the Restrictive Covenants. On November 15, 2001, RFTA accepted ownership of the Railroad Corridor from RFRHA, and RFRHA was dissolved. RFTA then replaced RFRHA as a party to the Restrictive Covenant Agreement. RFTA created a Covenant Enforcement Commission made up of representatives of each of its constituent entities that the Authority serves. It is the responsibility of the Commission to meet annually to make an assessment of the Rail Corridor and to recommend to RFTA that it make any corrections necessary to ensure that the conservation values of the areas described within the Covenant Agreement are not compromised as long as such corrections are consistent with this ACP.

V. RIO GRANDE TRAIL – RECREATIONAL TRAILS PLAN

The overall intent of the Recreational Trails Plan is to develop a trail and recreation plan for the Corridor that provides a wide range of public recreational opportunities including trails, river access, wildlife viewing, habitat conservation, and educational and interpretive activities.

The purpose of the Recreational Trails Plan is as follows:

A. To provide a continuous trail between Glenwood Springs and Woody Creek within the Railroad Corridor that has been environmentally cleared through a National Environmental Policy Act (NEPA) process;

B. To work with other Trails organizations in the Roaring Fork Valley to explore additional recreational and commuter connection opportunities;

C. To meet the expressed community recreational needs;

D. To develop trails programming and design principles that will provide a quality trail experience;

E. To plan for support facilities such as trailheads and parking;

F. To minimize impacts on adjacent landowners; and

G. To develop implementation costs.

The Rio Grande Trail construction was completed in 2008. The RFTA Trails Department continues to work with RFTA's member jurisdictions, other local jurisdictions, and other trails consortiums to stay up to date on the latest recommended safety improvements and recommendations for trail construction and amenities to keep the Rio Grande Trail one of the best and most widely used trails in the state.

VI. POLICIES FOR MANAGING RAILROAD CORRIDOR CROSSINGS AND ENCROACHMENTS

1.0 Title

This Policy shall officially be known, cited, and referred to as the "Access Control Plan." (ACP)

2.0 Purpose, Intent, and Audiences.

A. This Policy is intended to promote stewardship of the Railroad Corridor by RFTA, RFTA's member jurisdictions, CDOT, GOCO, and adjacent property owners, in an attempt to preserve the Railroad Corridor consistent with 16 U.S.C. 1247(d).

B. The purpose of this policy is to:

1. Preserve the Railroad Corridor for future private and public transportation options to maintain the Corridor's railbanked status under 16 U.S.C 1247(d) and under the jurisdiction of the STB for future freight and/or commuter rail reactivation.

2. Establish guidelines to ensure reasonable access into and across the corridor for present and future users which are consistent with its status as a railbanked corridor.

3. Support, promote, and maintain the Corridor's trail, open space, and public uses.

4. Ensure the safe operation of existing Railroad Corridor crossings.

5. Ensure the safety of trail users of the Railroad Corridor at private and public at-grade crossings of the Railroad Corridor.

6. Minimize and consolidate new or existing at-grade crossings over the Railroad Corridor whenever practicable in light of the Corridor's purpose and use optimization and costs.

7. Implement the Restrictive Covenant objectives, by avoiding adverse impacts to the open space, recreation, scenic, and wildlife values of the Corridor, and adjacent lands that add to the scenic value and enjoyment of the Corridor. When adverse impacts cannot be avoided, they shall be mitigated to the extent practicable.

8. Minimize, to the extent feasible, future financial liability and costs to RFTA and constituent-member jurisdictions arising from third-party use of the Railroad Corridor, including the expense of upgrading any existing or approved crossings of the Railroad Corridor, as practicable. Approval may include obtaining financial security.

C. The intended audiences for the ACP are:

1. RFTA's member jurisdictions, Garfield County, CDOT, GOCO, the RFTA Board of Directors, and RFTA staff tasked with the management of the Railroad Corridor;

2. Adjacent property owners currently holding a license, lease, contract, or easement for access across or encroachment upon the Railroad Corridor or adjacent property owners requesting a license, lease, contract, or easement for access across or encroachment upon the Railroad Corridor; and

3. Local, State, or Federal jurisdictions and/or Utility Companies currently holding a license, lease, contract, or easement for access across or encroachment upon the RFTA Railroad Corridor or requesting new access to the RFTA Railroad Corridor.

3.0 Authority

The RFTA Board of Directors, (the "Board") has the authority to review, approve, conditionally approve, and disapprove applications for construction, reconstruction, realignment, consolidation, and modification of Railroad Corridor crossings. The Board's authority emanates from intergovernmental agreements, adopted pursuant to the Rural Transportation Authority Act, Section 43-4-601, et seq. The Board's authority also stems from RFTA's status as "Interim Trail Manager" and holder of rights to reactivate freight rail service arising under the

federal law pertaining to the Railroad Corridor's railbanked status under the jurisdiction of the STB. RFTA acknowledges that this authority is exercised subject to the rights of public and private interests underlying and adjacent to the Corridor.

4.0 Jurisdiction

The ACP applies to the entirety of the Railroad Corridor owned by RFTA, generally from the Railroad Corridor's connection with the Union Pacific Railroad mainline (WYE area) in Glenwood Springs to County Road 18 in Woody Creek.

5.0 Interpretation, Conflict, and Severability

A. Interpretation. This ACP shall be interpreted to be consistent with all applicable federal requirements and orders of the STB or applicable court decisions. The ACP shall be interpreted consistent with RFTA's objectives to operate a public trail on the Corridor while preserving the Corridor for future freight rail and/or compatible commuter rail reactivation in order to ensure its continued eligibility for federal railbanking status, to otherwise maintain the Corridor for open space and park uses consistent with its obligations under the GOCO agreement, the Corridor's 6(f) designation under the Land and Water Conservation Fund, its eligibility for listing on the National Register of Historic Places in 1999, and to promote other compatible and lawful public uses. This Policy shall be construed broadly to promote the purposes for which it is adopted.

Notwithstanding anything in this document to the contrary, because this ACP is advisory, nothing herein is intended to grant to or permit any adjacent landowner or public entity any greater rights of access over, under, along or across the Corridor, then they would otherwise have under Colorado law or to impair or limit RFTA's rights as a public entity and landowner in managing its Corridor.

B. Conflict.

1. **Public Provisions**. The STB has exclusive jurisdiction over transportation by rail, including the railbanked right-of-way such as the Railroad Corridor (16 U.S.C. 1247(d)). In addition, 49 U.S.C. 10501(b) expressly preempts state and local law inconsistent with keeping railroad corridors intact for future freight rail reactivation and interim trail use.

2. **Private Provisions**. To the extent consistent with 16 U.S.C. 1247(d) and 49 U.S.C. 10501(b) this ACP is not intended to abrogate any, license, lease, easement, covenant, or any other private agreement or restriction, provided that where the provisions of the ACP are more restrictive or impose higher guidelines or regulations than an existing license, lease, contract, easement, covenant, or other private agreement or restriction, then the requirements of this ACP shall apply upon termination or expiration of such license, lease, easement, covenant, or other private agreement. RFTA will not unreasonably withhold the issuance of new licenses to new owners when properties are sold as long as such licenses are consistent with this ACP and DG.

C. **Severability**. If any part or provision of this Policy or the application of the Policy to any person or circumstance is adjudged invalid by any court of competent jurisdiction and such judgment is upheld on appeal, if applicable, notwithstanding the federal jurisdiction of the STB, the judgment shall be confined in its operation to the part, provision, or application directly involved in the controversy in which the judgment shall be rendered and it shall not affect or impair the validity of the remainder of the Policy or the application of them to other persons or circumstances. The Board hereby declares that it would have enacted the remainder of the Policy even without any such part, provision, or application that is judged to be invalid.

6.0 Amendments

The ACP cannot anticipate every circumstance or question arising from RFTA's management of the Railroad Corridor and the Rio Grande Trail and the need may arise to change the policies, procedures, or guidelines described in the ACP policy. The RFTA Board of Director's reserves the right to adopt amendments to the ACP pursuant to RFTA Procedures at the time of any proposed amendment. Unless an emergency exists, amendments of the ACP will require two readings by the RFTA Board of Directors prior to adoption and can only be adopted in the same manner that the ACP is adopted, i.e. by a unanimous vote of the seven original RFRHA member jurisdictions.

7.0 Owner Defined

"Owner" means the legal owner of real property or right-of-way, including easements, or the person or entity that holds fee title to the property or right-of-way or their designee. Owners may include public bodies, as in the case of a street right-of-way, or private entity (e.g., private landowners and utility companies).

8.0 Great Outdoors Colorado Requirements and Locations Defined

RFTA created a Covenant Enforcement Commission made up of representatives from each of its constituent entities that the Authority serves. It is the responsibility of the Commission to meet annually to make an assessment of the Railroad Corridor and to recommend to RFTA that it make any corrections necessary to ensure that the conservation values of the areas described within the Conservation Agreement are not compromised. The restrictive covenants require, among other things, that no new structures, fences, crossings, or pavement be placed on and that no mining or harvesting of timber occurs within the Corridor.

The assessment of the nine conservation areas will generally be conducted annually wile this ACP is in effect. The full report includes a spreadsheet that summarizes the observed violations, the remedies recommended, and the actions taken to address each violation. The spreadsheet is a living document, a checklist to be used by RFTA to track violations and take actions to resolve them.

The following is a list and brief description of the nine conservation areas:

1. **Conservation Area #1: Railroad (RR) Milepost 362.90 to 363.82 or RFTA Milepost 2.68 to 3.60 (0.92 miles – 21.3 acres)** - Running from the Glenwood Springs City limits south to the intersection of Highway 82 and Grand Avenue (old Highway 82), this area is well vegetated by native, scrub oak dominated mountain-shrub vegetation that offers excellent habitat for birds and small animals.

2. **Conservation Area #2: RR Milepost 365.40 to 366.47 or RFTA Milepost 5.18 to 6.25 (1.07 miles – 14.7 acres)** - This section begins at the crossing of County Road 107 (known as Coryell Ranch Road) to a location about one-fourth-mile below the CMC Road/Highway 82 intersection. This area is well vegetated by mature native, mountain-shrub and related plant species that offer excellent habitat for birds and small animals.

3. **Conservation Area #3: RR Milepost 368.50 to 369.00 or RFTA Milepost 8.28 to 8.78 (0.50 miles – 6.1 acres)** - This section of the Railroad Corridor covers the broad bend in the Roaring Fork River between the River Edge property and the ranchette parcels near Aspen Glen. There are mature sage shrubs in this section and the mountain shrub ecosystem on the Corridor in this area provides excellent habitat for birds and small animals.

4. **Conservation Area #4: RR Milepost 370.50 to 370.92 or RFTA Milepost 10.28 to 10.70 (0.42 miles - 7.4 acres)** - This section goes from about a three-fourths-mile south (up valley) of the Aspen Glen entrance to a private crossing located just below the confluence of the Crystal River and the Roaring Fork River. This area is well vegetated by mature native, mountain-shrub and related plant species that offer excellent habitat for birds and small animals.

5. **Conservation Area #5: RR Milepost 371.69 to 371.83 or RFTA Milepost 11.47 to 11.61 (0.14 miles – 3.4 acres)** - This section surrounds the Railroad Bridge at Satank and offers excellent river and recreation access opportunities and preserves wetland and riparian habitat. Views of Mt. Sopris are provided on the bridge.

6. **Conservation Area #6: RR Milepost 376.14 to 381.82 or RFTA Milepost 15.92 to 21.60 (5.68 miles – 85.7 acres)** - This section begins near the Catherine Store Bridge (County Road 100) and continues southwest to Emma Road including the Rock Bottom Ranch property. Rock Bottom Ranch is owned by a non-profit entity, the Aspen Center for Environmental Studies, as a nature preserve. The nature preserve is also encumbered by a Conservation Easement held by the Aspen Valley Land Trust (AVLT). The Railroad Corridor is nestled between a broad, riparian area of the Roaring Fork River and Bureau of Land Management property. A number of conservation values are provided within this section of the Corridor including riparian and wetland habitat protection; access to river recreation opportunities; access to public lands; preservation of habitat critical to eagle, hawk and heron populations in the valley; and preservation of winter range migratory patterns for macrofauna (mule deer and elk).

7. **Conservation Area #7: RR Milepost 382.19 to 384.90 or RFTA Milepost 21.97 to 24.68 (2.71 miles – 33.1 acres)** - This section begins shortly east of the Emma Road/Highway 82 intersection, continues toward the Basalt High School between ranch properties and federal lands and ends just west of the Wingo pedestrian bridge over Highway 82. A parcel of land owned by the Pitkin County Open Space and Trails Program along the Corridor contains a conservation easement to preserve a known migratory route for mule deer and elk. Another portion of the private property in this area contains a golf course and very low-density housing. The area is well vegetated by mature, native, mountain-shrub and related plant species that offer excellent habitat for birds and small animals.

8. **Conservation Area #8: RR Milepost 384.90 to 388.05 or RFTA Milepost 24.68 to 27.83 (3.15 miles – 36.6 acres)** - This section starts at the east side of the Wingo Subdivision and continues southeast to the end of the Dart Ranch on Lower River Road. Several conservation values are present on this section of the Corridor, including habitat for birds and small animals along the interface between mountain shrub and grassland habitat; access to the Roaring Fork River for recreation; access to National Forest lands; and preservation of critical habitat for macrofauna (mule deer and elk). A significant portion of this section is surrounded by a conservation easement held by Pitkin County on the Dart Ranch. Riparian vegetation along the Roaring Fork is also present. The Railroad Corridor can access several fisherman easements along the Roaring Fork River.

9. **Conservation Area #9: RR Milepost 390.58 to 393.67 or RFTA Milepost 30.36 to 33.45 (3.09 miles – 37.2 acres)** - This section begins near the crossing of Lower River Road, continues through the Woody Creek area until the end of the Corridor at Woody Creek Road. The riverside of this section contains mountain shrub and riparian vegetation that offers excellent habitat for birds and small animals. The Railroad Corridor is situated on a steep slope that comes down from Triangle Mountain (National Forest lands) and ends at the Roaring Fork River. The Railroad Corridor affords access to both the Roaring Fork River and National Forest lands. In addition, the Railroad Corridor can access several fisherman easements along the Roaring Fork River. The uphill side of the Railroad Corridor contains primarily steep shale hillside and includes or is adjacent to Lower River Road. In the Woody Creek area, the Railroad Corridor is perched on a short but steep hillside that affords excellent views of the Elk Mountain range and Aspen-area ski resorts.

9.0 Rio Grande Trail within the Railroad Corridor Requirements.

Trail Use: The Rio Grande Trail is designed, built, and operated within the Railroad Corridor and is operated for multi-purpose use. Trail uses, including walking, running, biking, skating, equestrian, and cross-country skiing, should be encouraged. No motorized use except for emergency access and maintenance vehicles and authorized electrically-assisted bicycles will be allowed. No camping or open fires will be allowed on the Railroad Corridor.

Linkages: Access and increased connections to the trail should be encouraged to maximize use by, between, and among neighborhoods and communities. Insofar as connections are consistent with the ACP and DG, and would not degrade the overall quality of the RGT user experience or safety, every effort will be made to allow for easy, convenient, and direct access to the trail. Connections will be coordinated to provide access consistent with the purposes of this policy. A regional recreational experience for all individuals and non-motorized modes will be emphasized as a part of the trail experience. Trail access is governed by RFTA's Recreational Trails Plan and administered by RFTA's Assistant Director, Project Management & Facilities Operations & RFTA's Trails Manager and staff. Design principles are located in:

- RFTA's Recreational Trails Plan and RFTA's DG
- AASHTO "Guide for the Development of Bicycle Facilities, 4th Edition" Guide for the Development of Bicycle Facilities, 4th Edition, 2012 - Table of Contents, Introduction, and Index (nacto.org) or Appendix A
- FHWA – FTA – United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations - Guidance - Bicycle and Pedestrian Program - Environment - FHWA (dot.gov) (see section 10, Design Guidance); Guidance - Bicycle and Pedestrian Program - Environment - FHWA (dot.gov)

Environmental Impacts/Mitigation: The overriding goal of trail design and management has been to protect the natural quality of the Corridor. This was done through minimization of impacts to the natural environment through design, management, and education. Sensitive areas were identified and mitigation measurements were and will continue to be implemented where appropriate.

Safety: Safety of the trail user and the adjacent landowners have been addressed through design and management techniques. This includes providing adequate width to avoid user conflicts, situating trail access points so that they are sensitive to safety, and should include providing barrier protection where appropriate between trail and transit when transit returns to the Railroad Corridor. Perimeter fencing may also be used in various locations to reduce conflicts with livestock and wildlife.

Implementation: Implementation of the overall trail system has been a regional effort that included the local, federal, and state government agencies. RFTA was

responsible for implementation of the sections of the trail not developed by local jurisdictions.

10.0 Types of Crossings and Encroachments Defined

A. Private Crossings and Encroachments shall include:

1. **Private Road Crossing** - means a crossing of the Railroad Corridor by a private driveway or road at a single point for ingress and egress to an adjacent property for a homeowner and/or business. A private driveway or road must be approved by RFTA and granted by a license, lease, or contract. Failure to obtain approval from RFTA for the encroachment, failure to pay the license, lease, contract fee, or failure to comply with RFTA DG guidelines may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of a crossing or as a waiver of RFTA's rights. **(Refer to process in section 16.0)**

2. **Private Utility Crossing** – means a crossing of the Railroad Corridor by a utility service for a single point service to serve an adjacent homeowner and/or a business whether above ground or below ground. A private utility crossing must be approved and licensed, leased, contracted by RFTA. Failure to obtain approval from RFTA for the encroachment, failure to pay the license, lease, contract fee, or failure to comply with the RFTA DG may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of a crossing or as a waiver of RFTA's rights. **(Refer to process in section 15.0)**

3. **Private Encroachment** is any use of any portion of the Railroad Corridor other than a Private Road Crossing or Private Utility Crossing without the permission of RFTA. Typical encroachments include fences, buildings, retaining walls, or temporary construction accesses that encroach upon the Corridor, or agricultural or landscaping activities or uses by adjoining landowners that encroach upon the Corridor. RFTA shall treat any private encroachment similar to a crossing and shall require a license, lease, contract for it. Failure to obtain approval from RFTA for the encroachment, failure to pay the license, lease, contract fee, or failure to comply with RFTA DG guidelines may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of a crossing or as a waiver of RFTA's rights. The Storage of vehicles, debris, trash, fences,

etc. are examples of encroachments incompatible with open space, trails, rail, wildlife and aesthetic uses of the Railroad Corridor that will not be licensed, leased, contracted by RFTA. **(Refer to process in section 15.0)**

B. Public Crossings and Encroachments shall include:

1. **Public Road Crossing** means a road-rail crossing where the road on both sides of the crossing is under the jurisdiction of and/or maintained by the state, county, city or town. Public road crossings may be granted by easement, so long: (1) as the designs are consistent with RFTA's ACP and DG or such other design as may be approved by the RFTA Board of Directors; (2) the road authority obtains any necessary PUC approval of the crossing; and (3) the easement is approved by the RFTA Board of Director's. Failure to obtain approval from RFTA for the public crossing may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of a crossing or as a waiver of RFTA's rights. The design for a public crossing must be reviewed, approved by RFTA, and to the extent the Colorado Public Utilities Commission (CPUC) has jurisdiction over railbanked crossings, require approval by the CPUC. **(Refer to process in section 16.0)**

2. **Public Utility Crossing** means a crossing of the Railroad Corridor by a public utility meant to serve more than one residence or business. Unless otherwise ordered by a court, a public utility crossing must be approved by RFTA. To the extent CPUC has jurisdiction over utility crossings of railbanked corridors, such a crossing will also require approval by the CPUC and RFTA shall have the right to oppose that approval request unless such crossing is consistent with this ACP and DG or is appropriately approved by the RFTA Board of Directors. Failure to obtain approval from RFTA for the utility crossing, failure to pay the license, lease or contract fee, or failure to comply with the RFTA DG or any applicable court, CPUC, or STB order may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of a crossing or as a waiver of RFTA's rights. **(Refer to process in section 16.0)**

3. **Public Encroachment** means any use of any portion of the Railroad Corridor with the permission of RFTA. Typical encroachments include fences, buildings, retaining walls, or temporary construction access that encroach upon the Corridor, or agricultural or landscaping activities or uses by

adjoining landowners that encroach upon the Corridor. It is RFTA's policy to treat any encroachment as similar to a crossing and to require a license, lease, or contract for any encroachment. An unapproved encroachment is a trespass and must either be approved by lease, license or contract by RFTA or removed. Failure to obtain approval from RFTA for the encroachment, failure to pay the license, lease or contract fee may result in RFTA pursuing all available remedies. Failure to pursue a remedy in no event shall be construed as an approval of an encroachment or as a waiver of RFTA's rights. The storage of vehicles, debris, trash, fences, etc. are examples of encroachments incompatible with open space, trails, rail, wildlife and aesthetic uses of the Railroad Corridor that will not be, licensed, leased or contracted by RFTA. **(Refer to process in section 16.0**)

11.0 Permitted Crossings Defined

A "crossing" means any crossing of the Railroad Corridor by a public street, private drive, trail, utility, or similar facility.

"Permitted crossings are crossings approved by license, lease, contract, or easement by RFTA and for public crossings also approved by the CPUC.

Permitted crossings include, but are not limited to, the following:

A. Crossings that had a license, lease, contract, or easement in place and effective at the time of RFTA's (previously RFRHA's) purchase of the Railroad Corridor from Southern Pacific Transportation Company (Appendix A – List A); or

B. Crossings for which RFTA has granted a license, lease or contract, to the extent the crossings comply with the terms of the licenses, leases, contracts, including crossings used exclusively by RFTA (Appendix A – List A); or

C. Crossings that RFTA (previously RFRHA), CDOT, and GOCO have approved as a "proposed new crossing" (Appendix A -- List B) or

D. New Crossings that RFTA may approve upon further review (Appendix A -- List C)

E. “Existing Crossings” shall include all permitted and unpermitted crossings in Existence at the time of the adoption of the ACP. All existing crossings are subject to the terms of the ACP.

F. Any crossing that is not a "permitted crossing" may be closed at the direction of the RFTA Board of Director's discretion at any time.

12.0 Improvements and Maintenance for Existing Crossings

A. Improvements.

1. Owner-initiated: The costs of owner-initiated improvements to crossings shall be borne by the owner, and owners will be responsible for improving their existing crossings consistent with this ACP and DG, so as to allow and not preclude or permanently interfere with future freight rail reactivation. To the extent, RFTA will benefit from such improvements or maintains a significant interest in the condition or manner of improvements to be made, RFTA may collaborate with the owner and negotiate a proposed contribution to the cost of improvements. However, nothing in this document, paragraph, or section, is intended to obligate RFTA to make any contributions or otherwise obligate RFTA to collaborate on such improvements.

2. RFTA initiated: In the event of other general transit system improvements initiated by RFTA, RFTA will bear the costs of such improvements. To the extent RFTA’s improvements provide a significant, discrete benefit to identifiable owners, above the benefit conferred to other owners, RFTA shall cooperate with said owners and negotiate the parties’ equitable contributions to the cost of improvements.

3. In the even that a proposed public or private project causes a verifiable increase in either the peak hour vehicular volume or the total vehicular volume using the corridor crossing, or a documented safety issue exists, the need for rail/trail and/or safety improvements shall be assessed. RFTA may cooperate with owners to allocate the cost of the safety improvements between the owners and RFTA as equitably as practicable. However, nothing in this document, paragraph, or section, is intended to obligate RFTA to make any contributions or otherwise obligate RFTA to collaborate on such improvements.

4. In instances in which improvements have been agreed to under the terms of a license, lease, contract, or easement agreement or by separate proceedings.

RFTA shall review and approve the design for conformance with RFTA's DG, and will also review and approve the materials to be used and specifications for all construction, in accordance with this ACP. No improvements shall be made unless a permit, therefore, has been issued by RFTA in accordance with Section 16.B.2.

B. Private Crossing Maintenance Responsibility. Owners shall maintain their roadway approach in a state of good repair. Maintenance shall include, but not be limited to, removing rocks, soil, vegetation and other material that may fall, slide, wash, or be placed onto crossing areas; and maintaining the railroad or trail crossing free of other obstructions (e.g., snow storage, parked vehicles, equipment, etc.); maintaining the approach grades and acceptable pavement condition to the end of the ties; proper drainage in the crossing area; maintaining a clear view, or site distances required in the DG and maintaining any gate crossing appurtenances. As a last resort and after reasonable notice, RFTA retains the right to undertake supplemental maintenance at the owner's expense, as necessary.

C. Public Crossing Maintenance Responsibility - All public and utility crossings shall be maintained by the roadway authority or public utility in good condition, and in a manner that is consistent with maintaining the Corridor pursuant to 16 U.S.C. 1247(d) and does not preclude or permanently interfere with RFTA’s ability to reactivate freight or initiate commuter rail service. The owner(s) of a public street or utility crossing shall be responsible for:

1. Maintaining and repairing their respective crossing(s);

2. Obtaining approvals from RFTA and any other applicable permitting authority (ies) (e.g., local government or CDOT) prior to commencing work on an existing crossing or altering an existing crossing. (If creating a new crossing, RFTA will also require a signed maintenance and operating agreement to be negotiated between the road authority and RFTA prior to final approval for any such public or utility crossing of the Railroad Corridor); and

3. To the extent the CPUC has jurisdiction over railbanked Corridor crossings, obtaining required approval for new public or utility crossings and/or alterations to existing public or utility crossings from the CPUC.

D. Any construction shall include the obligation to request a permit for the work and revegetate the disturbed areas according to RFTA's Revegetation Policy for a minimum of three years, which is available through RFTA's website, www.rfta.com, or on file in the RFTA office.

13.0 Design Guidelines for Proposed New Crossings or Up-Grading, Modifying, and Improving Existing Crossings.

In addition to the specific requirements contained below in this Section 13.0, all upgraded, modified, or improved crossings, and all new crossings, shall meet the current minimum DG adopted by RFTA, included as Appendix B of this Policy, and shall be constructed in a manner consistent with this ACP. Any upgrades, modifications, or improvements to existing crossings and any new crossings shall be constructed in a manner that does not preclude or permanently interfere with RFTA's ability to reactivate freight rail service or initiate commuter rail service.

The general types of crossings are listed in subsections A through E below. Pursuant to 12.0, above, an owner may be required to upgrade an existing crossing that does not comply with the DG, and may also require safety improvements when freight or commuter rail activation takes place, a subdivision or site development is proposed, or when the crossing itself is proposed to be improved, realigned, or reconstructed. RFTA shall coordinate with the crossing owner, local, state jurisdictions and the CPUC to determine when improvements are required and develop cost allocations for the improvements. In those cases where crossings require safety improvements, RFTA may collaborate with the owner(s) and other parties' in determining equitable contributions in making such improvements. However, nothing in this document, paragraph, or section, is intended to obligate RFTA to make any contributions or otherwise obligate RFTA to collaborate on such improvements.

A verifiable change in vehicular use of an existing crossing, which may include safety concerns, an increase in traffic, any physical changes proposed for the crossing location, or a change from a private crossing to a public crossing, may also result in the requirement to upgrade the crossing, or revocation/removal of the crossing and improvements.

A. **Grade-Separated Crossings**. A grade-separated crossing is a railroad or highway intersection consisting of an overpass or underpass structure that employs an elevation difference to avoid a direct connection between two physical alignments. An existing grade-separated crossing may require safety improvements in accordance with RFTA's DG, as well as review and approval by RFTA. To the extent the CPUC has jurisdiction of public road crossings over railbanked corridors; any safety improvements done in accordance with RFTA's DG may also require approval by the CPUC. RFTA may collaborate with the owner(s) of grade-separated crossings requiring safety improvements in order to determine RFTA's and other parties' equitable contributions in making such improvements. Any safety improvements may also require a license, lease, contract, or easement agreement with RFTA. Grade-separated crossings will most likely not be necessary or required until freight or commuter rail is imminent or active in the corridor, and in any event, will only be required if deemed necessary following a review of projected traffic volumes, the DG, and other safety concerns. If a new grade-separated crossing is proposed by a project sponsor before rail is active in the corridor, it should be constructed in accordance with RFTA's DG and must be consistent with this ACP.

B. **Public At-Grade Street and Highway Crossings**. All public at-grade street and highway crossings that require improvements in accordance with the DG shall, insofar as reasonably necessary and possible, be constructed and maintained in conformance with this ACP and the DG; are subject to review and approval by RFTA; may require a license, lease, contract, or easement agreement with RFTA; and to the extent CPUC has jurisdiction over public crossings of railbanked corridors, require approval and an allocation of costs by the CPUC.

C. **Private At-Grade Vehicle Crossings**. Private at-grade vehicular crossings may require safety improvements in accordance with the RFTA DG. Such improvements shall, insofar as reasonably necessary and possible, be constructed and maintained in conformance with this ACP and the DG; are subject to review and approval by RFTA; and shall also require a license, lease, or a contract agreement with RFTA.

D. **Trail Crossings**. Requests for new Trail crossings of the Railroad Corridor shall comply with the Recreational Trails Plan; RFTA's obligations under the 2001 GOCO Agreement on file with RFTA; and RFTA's DG. Trail connections designed and built in conformance with RFTA's DG may be approved unless unique circumstances would create unreasonable safety concerns, expenses, or would otherwise preclude or permanently interfere with RFTA's ability to reactivate

freight rail service or initiate commuter rail service; and also require a license, lease, contract agreement with RFTA.

E. **Utility Crossings.** All existing underground utility crossings shall continue to be underground. Newly proposed underground utilities shall be designed, constructed, and maintained in conformance with the RFTA DG and this ACP. Any above-ground utilities may continue to cross the Railroad Corridor above ground, but shall comply with RFTA's DG; include vertical clearance standards per the CPUC, as a minimum; are subject to review and approval by RFTA; and unless RFTA otherwise has consented, shall not create a future financial obligation or physical obstruction that would preclude or permanently interfere with RFTA's ability to reactivate freight rail service or initiate commuter rail service; and also require a license, lease, contract agreement with RFTA.

14.0 Crossing Repair Permits – Existing Crossings

All repairs to an existing crossing or other improvements in RFTA's right-of-way shall require a permit. RFTA may issue Repair Permits only after receipt of a written application. Applications for a permit shall describe the kind of repair to be made, the material to be used, and sketches, plans, and specifications therefor. Emergency repairs to critical infrastructure or necessary utilities may be performed without RFTA's prior approval. Any utility or local jurisdiction undertaking emergency repairs shall return the right-of-way to pre-repair conditions and notify RFTA of the event of such repairs as soon as practicable but no later than 24 hours.

Ensuring the safety of trail users will be the responsibility of the entity making emergency repairs.

15.0 Requirements for Approval of New Crossings.

A. **New Crossing Defined.** A "new crossing" means a crossing of the Railroad Corridor by a public street, private drive, trail, utility, or similar facility approved by RFTA pursuant to this ACP and to the extent the CPUC has jurisdiction over crossings of railbanked corridors, approved by the CPUC.

B. **Policy and Design Guidelines for New Crossings**

RFTA must exercise caution not to preclude or permanently interfere with RFTA's ability to reactivate freight rail service. Until freight or commuter rail is imminent or active in the corridor, RFTA will generally consider new public at-

grade crossings that are consistent with its DG or otherwise are approved by the RFTA Board of Directors.

When considering requests for new crossings, RFTA will first review the request for conformance with its primary obligations, which are to:

1. Preserve the Railroad Corridor for freight rail reactivation and interim trail use by preserving the Railroad Corridor's railbanked status under 16 U.S.C. 1247(d), under the jurisdiction of the STB;

2. Implement the conservation requirements of the Great Outdoors Colorado Restrictive Covenants and ensure the safety of recreational trail users.

3. Reference the DG (Appendix B) to ensure that to the greatest extent feasible the design meets the minimum DG developed by RFTA.

RFTA may attempt to negotiate and agree with crossing sponsors to an equitable allocation of design, construction, and maintenance costs for new crossings. If the Parties are unable to reach such an agreement, if applicable, they may seek the same by determination of the CPUC, as necessary. Nothing in this paragraph, however, is intended to obligate RFTA to pay any costs or to support such approvals at the CPUC.

C. Restriction on New Crossings to Serve New Parcels or Lots. RFTA desires to limit new at-grade crossings to serve any new parcels or lots, and to attempt to consolidate new crossings with existing crossings whenever practicable. The DG will be considered during the review of any proposed new crossing. "New parcel" means a lot or parcel that was created pursuant to state or local laws and regulations, after the approval of this ACP.

D. Denial of Private Crossings. RFTA retains the right to deny a private crossing request where another existing or proposed crossing provides reasonable access.

16.0 Process for the application for approval of a New Crossing.

A. General Considerations. For a private crossing, road, utility, or encroachment that will utilize any portion of the RFTA Railroad Corridor, property owners shall review the DG, (see Appendix B) submit an application to RFTA for a new

crossing and, if approved by RFTA, obtain a license, lease, contract, and construction permit from RFTA prior to commencing work on any Railroad Corridor crossing, improvements and/or consolidations. In addition to seeking approval from RFTA, if the crossing will tie into either the CDOT right-of-way or one of the local jurisdiction's street right-of-way, then owners will also need to obtain permission from CDOT and/or the local jurisdiction prior to commencing any work within the RFTA Railroad Corridor, or the CDOT and/or jurisdictional street right-of-way.

For a public crossing that is being proposed, in addition to the requirements listed above for a private crossing, the applicant shall also obtain any permits required by CDOT, and to the extent, the CPUC has jurisdiction over crossings of railbanked corridor crossings, require approval and an allocation of costs by the CPUC. If a public crossing is designed consistent with RFTA's DG or otherwise approved by the RFTA Board of Directors, RFTA will grant an easement to the project sponsor, subject to the approval of the RFTA Board of Directors and/or the CPUC. Until freight or commuter rail is imminent or active in the corridor, RFTA will generally approve new public at-grade crossings that are consistent with the DG or otherwise are approved by the RFTA Board of Directors, insofar as such crossings would not preclude or permanently interfere with RFTA's ability to reactivate freight rail service.

B. Process. The following review and permitting process applies to the RFTA Railroad Corridor only. It is the applicant's responsibility to check with local, state and federal agencies for any additional requirements related to working in their Rights-of-Way (ROW).

1. **Approval Criteria.** Leases, Licenses, Contracts for Railroad Corridor crossing improvements and consolidations and new crossings shall comply with the following approval criteria:

    a. In order to ensure compliance with 16 U.S.C. 1247(d) as construed by the STB and the courts, access to and across the Corridor should be designed by the project proponent to maintain the Corridor and its interim uses in such a manner so as to preclude or permanently interfere with RFTA's right to reactivate or reconstruct freight and/or commuter rail. Significant irreversible alterations and unfunded or unaccounted for financial obligations burdening the Corridor, including significant alterations in the alignment and/or elevations of the roadbed, property sales or transfers, and physical obstructions of the railroad line that are incompatible with freight rail reactivation, would be of significant concern to RFTA and

would require greater assurances from crossing sponsors with respect to how such issues would be addressed or mitigated. Any upgrades, modifications, improvements or consolidations should be constructed in a manner that does not preclude or permanently interfere with RFTA's ability to reactivate freight rail service or initiate commuter rail service;

b. To the extent feasible, the DG as applicable, unless otherwise approved by the RFTA Board of Directors;

c. The State Highway Access Code, as applicable;

d. Any applicable local government land use and access permit requirements (e.g., permit to construct in a public way);

e. Restrictive Covenant requirements, including, but not limited to: Avoidance of adverse impacts to the open space, recreational, parks, and wildlife uses and values of the Railroad Corridor to the extent practicable. This shall be accomplished through careful consideration of alternative access alignments, consolidations, construction techniques, materials, and appropriate mitigation measures (e.g., erosion control, landscaping, screening, buffering, etc.);

f. The agreement of the applicant to enter into a license, lease, contract, easement, or other agreement to memorialize the crossing.

2. **Applications for crossings, encroachments, utilities.** Permit applications for Railroad Corridor crossings, encroachments, utilities, repairs, improvements, and consolidations within the RFTA Railroad Corridor right-of-way shall provide the following:

a. Complete application form. RFTA shall provide standard application forms for proposed crossings, crossing improvements and crossing consolidations. The application forms (available online or from RFTA offices) shall provide the address and contact information for the owner and his/her contractor(s); the contractor license/registration number(s); a description of the proposed improvements; the construction schedule; proposed traffic control measures; and other pertinent information as deemed necessary by RFTA.

b. Payment of an application fee to cover the cost of processing the application. The fee schedule will be kept on file at RFTA offices and may also include costs for RFTA's, legal, engineering consultant

reviews, and survey services.

c. Submission of a site plan and related engineering drawings that include the Railroad ROW, prepared by a qualified licensed professional (e.g., engineer, surveyor, planner, landscape architect). The site plan and engineering drawings shall be drawn to a scale of at least 1-inch equals 40 feet. The plans and drawings shall be prepared in accordance with RFTA's DG and be designed as a crossing of a freight railroad. Applications shall list all materials to be used, and provide section details and construction specifications.

d. Applications for crossing consolidations shall include two sets of plans: one for the proposed Corridor crossing and one for the Corridor crossing to be closed, and shall be provided in both hard copy plot and electronic .pdf file format. Once approved, Digital CAD drawing files will be required in addition to the hard copy and .pdf, in accordance with the design guidelines.

e. The RFTA Chief Executive Officer or his/her designee shall be responsible for determining when an application is deemed complete.

C. RFTA Review Process for New Railroad Corridor Crossings. The following review procedures shall apply to applications for new crossings and encroachments. Public crossing application procedures will also require a Maintenance and Operating Agreement to be executed and, to the extent the CPUC has jurisdiction over railbanked Rail Corridors, submission to the CPUC for its review, approval and an allocation of costs.

1. The RFTA Chief Executive Officer or his/her designee shall review the applications submitted as per Section 16.0 (B.2) based on the approval criteria in Section 16.0 (B.1)

   a. RFTA may refer the application to its engineering consultant for review of conformance with the DG.

   b. The RFTA Chief Executive Officer or his/her designee shall prepare an administrative determination recommending approval of or denying the application.

c. The determination is final unless the applicant timely files an appeal in accordance with this subparagraph. The applicant may appeal the decision of the Chief Executive Officer or his/her designee by filing an appeal of the administrative determination in writing to the RFTA Board of Directors within thirty (30) days of receipt of the determination by the Chief Executive Officer and/or his designee. The thirty (30) day appeal period shall commence upon applicant's receipt of the determination decision, which determination decision will be emailed and posted on the RFTA website. Upon receipt of a timely written appeal, RFTA staff will forward the appeal to the RFTA Board of Director's for its consideration, along with the determination by the staff as to why the application was denied.

d. The determination shall be final unless appealed to the RFTA Board of Directors. If an appeal to the Board is made, a hearing will be scheduled at a subsequent Board meeting to take place no later than (90) days from the date a timely appeal is filed. Both the RFTA Chief Executive Officer and his/her designee and the applicant will be allowed to present his/her reasons for the upholding or overturning the staff determination.

e. The RFTA Board of Directors will make a final determination on an appeal and provide the appellant with a written determination thirty (30) days from the date the appeal hearing is concluded.

D. Other Requirements.

1. Easements for public roadway crossings and utilities, which are conveyed by RFTA to jurisdictions shall contain the following provision:

Railbanking Protection. "Jurisdiction" acknowledges that RFTA's Corridor is not abandoned and is under the jurisdiction of the federal Surface Transportation Board. "Jurisdiction" further acknowledges that the Corridor is "railbanked" under the National Trails System Act, 16 U.S.C.§1247(d) and is subject to the reactivation and restoration of rail service. This Easement shall not be deemed to give "Jurisdiction" exclusive possession of any part of the Easement area described, and nothing shall be done or suffered to be done by "Jurisdiction" at any time that shall in any manner impair the usefulness or safety of the Corridor or of any track

or other improvements on the Corridor constructed thereon by RFTA in the future. If RFTA in its sole discretion upon the advice of legal counsel believes that an action permitted by this Easement has or will preclude or permanently interfere with the reactivation of rail service or jeopardize the railbanked status of the Corridor RFTA shall notify the "Jurisdiction" and RFTA and the "Jurisdiction" shall work together to revise this Easement to correct the potential severance or impediment to freight rail service. Only in the event, no modification can be agreed upon, may RFTA terminate this Easement.

***Please note that all crossings are crossing a railroad that is railbanked for the preservation of the Corridor for reactivation of freight rail service and must be considered as such even though rail service may not be active on the Corridor at the time of submittal of applications for crossings*.**

2. Should RFTA need to extend, modify, or relocate a previously approved public roadway or public utility crossing easement in order to accommodate the reactivation of freight or passenger rail service on the Corridor, RFTA shall be entitled to do so; however, RFTA shall use its best efforts to ensure that the extension, modification, or relocation does not substantially and materially interfere with the connectivity of the crossing. RFTA shall submit for review and discussion any plans detailing the extension, modification, or relocation to the public entity holding the easement, and if required, obtain consent or approval by the public entity, which consent will not be unreasonably withheld, and if applicable, approval by the CPUC. If the sole cause of the need for such extension, modification, or relocation is the needs of RFTA, such cost will be borne by RFTA if RFTA approves the project and costs thereof; it being understood that any funding for such a project is subject to appropriation of funding. If the public entity holding the easement should desire to extend, modify, replace, relocate, or remove the crossing to further its needs, then such cost shall be borne by the public entity. Any such extension, modification, relocation, or replacement or repair by the public entity shall only be made in accordance with plans prepared by the public entity and reviewed and approved by RFTA, which approval will not be unreasonably withheld, and if CPUC jurisdiction is exercised, approval by the CPUC. For extensions, modifications, or relocations that are jointly caused and will benefit both parties, the allocation of costs shall be by further agreement, or if no agreement, then as determined by the CPUC or other applicable government entity.

17.0 Coordination of Development Review with Local Jurisdictions.

RFTA is and should remain a referral agency for land use and development applications that may affect the Railroad Corridor, including potential rail reactivation, RFTA's interim trail and public recreational uses, and restrictive covenants; therefore, RFTA desires to participate in the review of planning, zoning, and development applications to continue to secure its interests and to work cooperatively with RFTA's constituent-members and other local jurisdictions. It is not RFTA's intent to exercise its authority over the Corridor to limit or control local land use decisions along the Corridor unless such decisions will preclude or permanently interfere with the potential for future freight or commuter rail reactivation, interim trail and public recreational uses, and conservation covenants. Land use and development decisions are and should remain within the authority of the local jurisdiction with development review authority, but any applications or actions inconsistent with this ACP or DG will not be approved.

RFTA will coordinate with property owners, local governments, CDOT, and other affected agencies to identify areas of concern in any proposed crossing or improvement during the early stages of development, preferably before a formal development application has been submitted. RFTA will not withhold approval of any application, easement, license, lease, or other contract relating to a crossing or improvement that is consistent with RFTA's ACP and DG and approved by the RFTA Board of Directors. RFTA will work cooperatively with all interested parties to maximize efficient, reasonable access to and across the Railroad Corridor while securing RFTA's rights as necessary for potential rail reactivation and continued interim uses.

-END-

APPENDIX A

List of All Existing Uses, Proposed Uses and Potential Uses

Identified Accesses and Uses For the Roaring Fork Transportation Authority Railroad Corridor

Roaring Fork Transportation Authority

January 2018, Revised February 9, 2023

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(License Agreements, Lease Agreements, Public Crossings, Historic Crossings, Pending Agreements. Many of these are revocable licenses)

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LIST A

INVENTORY OF EXISTING USES

List A is a compilation to the best of RFTA's knowledge and efforts of all license agreements, lease agreements, easements, public crossings, and historic crossings. Many of these are revocable licenses; some are irrevocable easements, and some may exist without any formal documentation. RFTA cannot be responsible for any accesses that have been unintentionally omitted. These will have to be considered on a case by case basis as they are identified. RFTA will continue to review existing accesses to determine if they should continue to exist. By their inclusion on this list, RFTA does not agree, and it should not be interpreted by any third party, that any listed agreement or crossing will be accepted by RFTA in the future. There are also existing signposts, cattle guards, whistle boxes, and existing miscellaneous rail related structures/facilities, as well as historic existing private encroachments located sporadically along the Railroad Corridor.

Contract #	Licensee Name	Purpose	MP	Type	Use Description
6/17/2003	CPO, INC	Warehouse-2	360.44	Encroachment	Building
361.8	Diamond Carpet	Sign	361.8	Encroachment	Sign
362.83	Rader, Hayden	Portion of Building	362.83	Encroachment	Building
364.5	Jackson, Cater & Louise	Head Gate	364.5	Adjacent	Irrigation Ditch
23614	Jackson, Cater & Louise	Access Road	364.59	At-Grade	16' Private Road
30361	Jammaron, Glen & Kenneth	Access Road	365.06B	At-Grade	24' Private Road
28855	C.P.O. Orrison	Access Road	365.06C	At-Grade	24' Private Road
365.25-365.39	Eastbank, LLC	Agricultural	365.25 -	Encroachment	Grazing
367.1	Mountain Meadows Court - Mobile Home Park	Sewer & Water Lines	367.1	Underground	24" casing holding 4" water line & 8" Sewer Line
367.12	Barnett-Fyrwald Holding, Inc.	Portion of Facilities	367.12	Encroachment	Warehouse, utility shed & mobile home
367.15	Barnett-Fyrwald Holding, Inc.	Septic System	367.15	Underground	Septic System
367.18	Barnett-Fyrwald Holding, Inc.	Building	367.18	Encroachment	Portion of a Building
367.25-368.25	Sanders Ranch/Bair Chase	Temporary Access	367.25-368.25	At-Grade	Temporary Construction Easement
367.3 & 368.77	Sanders Ranch/Bair Chase	3 Ped underpasses	367.3 - 368.77	Underground	Up to 3 Pedestrian Underpasses
367.51	Sanders Ranch/Bair Chase	Access Road & Utility	367.51	At-Grade/ Underground	Private Road Crossing and Underground Utility
368.06	Sanders Ranch/Bair Chase	Access Road	368.08	At-Grade	18' Private Road Crossing and Underground Utility
30956	Richardson, D.G & Ruby	Access Road	369.32A	At-Grade	24' Private Road Crossing
30960	Larsh, Ed	Access Road	369.32B	At-Grade	24' Private Road Crossing
719390	Burry, Richard & Robert	Access Road	369.32C	At-Grade	24' Private Road Crossing
369.275	Ulrych, Andre	Access Road	369.32D	At-Grade	24' Private Road Crossing
369.69	Colorado Dept. of Natural Resources, Division of Wildlife	Access	369.32D	Access	24' Public Road Crossing - Granted by Robert

Contract #	Licensee Name	Purpose	MP	Type	Use Description
369.76 - 370.65	Accel/Decel Lanes	Parallel to RR ROW	369.76 - 370.65	Easement	Acceleration and Deceleration Lanes
369.93	Aspen Glen	Access Road	369.93	At-Grade	Private Main Access
370.35	Aspen Glen	Utility Easement	370.35	Easement	Utility Easement
370.55	Aspen Glen	Emergency Access	370.55	Easement	Emergency Vehicle Access
370.55 - 370.88	Aspen Glen	Road Encroachment	370.55 - 370.88	License	Parallel Dirt Road to be used for maintenance
370.67	Roaring Fork Water & Sanitation District	Utility	370.67 - 370.8	Easement	Water, gas, sewer, cable for Aspen Glen/Coryell Ranch
370.95	Nichols, Peter	Access Road	370.95	License	16' Private Road Crossing
371.24	Mary DiFranco	Land	371.24	Lease	Parking Lot
371.25	Mary DiFranco	Land	371.25	Lease	Part of a mobile home, flagstone porch, shed
371.225	Fulstone, Amy - Confluence Lodge	Encroachment	371.26	Encroachment	Part of a yard, stairs down to the trail and river
371.45	Colorado Dept. of Natural Resources, Division of Wildlife	Road Access	371.45	At-Grade	Access Road down to the River by Carbondale
371.47	Dag, Stefan	Road Access	371.47	At-Grade	18' Private Road Crossing
27309	Redstone Corporation	Utility	372.73	Underground	16" Pipeline
372.25	Compass - Carbondale Community School	Encroachment	375.5	Encroachment	Fence and playground area
27305	Whalen, Mark and Anne Marie	Road Access	373.14A	At-Grade	20' Private Road Access
27305	Whalen, Mark and Anne Marie	Road Access	373.14B	At-Grade	20' Private Road Access
27305	Hall, Kristin	Road Access	373.14C	At-Grade	20' Private Road Access
710402	Deane, Buck	Encroachment	373.15	Encroachment	Yard Landscaping
27314	Nieslanik, Paul, John, and Robert	Road Access	373.17	At-Grade	20' Private Road Access
373.18	Crownhart, Karen	Road Access	373.18	At-Grade	20' Private Road Access
373.8	IRMW, LLC	Road Access	373.8	At-Grade	24' Private Road Access
374.2	IRMW, LLC	Road Access	374.2	At-Grade	24' Private Road Access
374.9	IRMW, LLC	Road Access	374.2	At-Grade	24' Private Road Access
374.9	Eubank, Dale	Road Access	374.9	At-Grade	24' Private Road Access
375.58	Coffman Ranch, LLC.	Road Access	375.58	At-Grade	16' Private Road Access
376.05	Coffman, Rex	Road Access	376.05	At-Grade	16' Private Road Access
378.25 & 378.70	Aspen Center for Environmental Studies (ACES)	Connection	378.6 & 378.65	At-Grade	Two Soft Surface Trail Connections & Landscaping
378.62 & 378.66	Woods, Frank and Tamara	Road Access	378.62 & 378.65	At-Grade	Two 16' Private Road Accesses
378.62 & 378.66	Woods, Frank and Tamara	Encroachment	378.62 - 378.65	Encroachment	Landscape and Fencing for privacy and screening
378.88	Aspen Center for Environmental Studies (ACES)	Encroachment	378.88	Encroachment	Sign
379.01	Hookspur Ranch Homeowners Association	Road Access	379.01	At-Grade	12' Private Road Access
379.01B	Glassier, Randy and Wendy	Encroachment	379.01B	At-Grade	Fence for Screening
379.01	Glassier, Randy and Wendy	Road Access	379.01	At-Grade	16' Private Road Access
379.4725	Smith, Laura	Road Access	379.4725	At-Grade	16' Private Road Access
379.4725B	Smith, Laura	Encroachment	379.4725	At-Grade	Two Sheds
379.51	Davies, Brian and Michael	Road Access	379.51	At-Grade	Private Road Access
379.51	Davies, Brian and Michael	Encroachment	379.51	Encroachment	Sign
379.75	Hooks Spur Road, LLC.	Encroachment	379.75	Encroachment	Agricultural
379.83A	Hooks Spur Road, LLC.	Road Access	379.83	At-Grade	16' Private Road Access
379.83BB	1/2 AS Ranch Holdings, LLC	Road Access	379.83	At-Grade	16' Private Road Access

Contract #	Licensee Name	Purpose	MP	Type	Use Description
380.62	Dreager, Edward	Road Access	380.62	At-Grade	16' Private Road Access
280281	Frazier, James & Perrow, Martha Jean	Encroachment	380.7	Encroachment	11' Building Encroachment
091500 - 381.4	Caruso, Mary Gail	Utility	381.4	Underground	Gas Pipeline
24957	Obermeyer, Klaus	Road Access	381.75	At-Grade	16' Private Road Access
2001-0001	Barry-Wehmiller Group, Inc.	Utility	383	Underground	Gas Pipeline
302861	Roaring Fork Public Schools	Utility	383.8	Underground	2" Water Line
384.27	Roaring Fork Club	Utility	384.27	Underground	Various Utilities
1997-384.44/384.83A	Roaring Fork Club	Utility	384.44 & 384.83	Underground	Two Separate Utility Corridor
1997-384.44	Roaring Fork Club	Road Access	384.44 & 384.83	At-Grade	Two Separate Private Road Accesses
385.05	Colorado Department of Transportation (CDOT)	Pedestrian Bridge	385.05	Above Grade	Wingo Junction Bridge & Road Lowering
385.43	Roaring Fork Meadows, LLC.	Road Access	385.43	At-Grade	20' Private Road Access
385.43B	Roaring Fork Meadows, LLC.	Utility	385.43	Underground	Three 4" conduits for utilities to the subdivision
386.05 - 386.35	Weida, Mark	Utility	386.05 - 386.35	Underground	1" Gas Pipeline
386.43	Weida, Mark	Road Access	386.43	At-Grade	14' Private Road Access
388.37	Cathers, Paul	Road Access	388.37	At-Grade	16' Private Road Access
28081	Royer, Judith	Road Access	388.41	At-grade	16' Private Road Access
28247	Wehmiller Group	Road Access	388.41	At-Grade	16' Private Road Access
1998-388.41C	Galardi, John	Road Access	388.41	At-Grade	16' Private Road Access
388.41D	Wehmiller Group	Road Access	388.41	At-Grade	16' Private Road Access
28875	Jandegian, Jeff	Road Access	388.41	At-Grade	16' Private Road Access
388.41C	Jandegian, Jeff	Encroachment	388.41	Encroachment	Livestock Privacy Berm
29237	Chapman	Utility	388.73	Underground	Water Pipeline
389.25	Cote	Road Access	389.25	At-Grade	16' Private Road Access
389.4	Schlumberger, Martin	Road Access	389.4	At-Grade	16' Private Road Access
389.5	Cherek, C.R. & Moffat, Andrew	Road Access	389.5	At-Grade	Private Road Access
389.51B	Kirvida, Kevin and Kathy	Road Access	389.51	At-Grade	14' Private Road Access
389.28	LAKLC, LLC.	Road Access	389.28	At-Grade	16' Private Road Access
389.215	LAKLC, LLC.	Encroachment	389.215	Encroachment	Shed
390.69	River's Bend Condominiums	Road Access	390.69	At-Grade	30' Private Road Access
390.69A	River's Bend Condominiums	Road Access	390.69	At-Grade	Parking Lot
390.69B	Hanson, Thomas	Road Access	360.69	At-Grade	30' Private Road Access
390.82	Feldman, Gary	Road&UtilityAccess	390.82	At-Grade & Underground	Private Road, Septic System, Sewer Line Wall
282411	Swersky, David	Road Access	390.68	At-Grade	30' Private Road Access
391.45A	Swearingen, William	Land	391.45	Encroachment	Old Rail Car
391.49	Larsh, Sky	Land	391.45	Encroachment	Old Rail Car
392.06	Rudd, Leslie	Road Access	392.06	At-Grade	16' Private Road Access
392.10A	Rudd, Leslie	Road Access	392.1	At-Grade	16' Private Road Access
392.10B	Rudd, Leslie	Road Access	392.1	At-Grade	16' Private Road Access
392.21	Bayer, Gail	Utility	392.21	Underground	Gas Pipeline
WAB-392.21	Hudgens, Mark and Grace	Road Access	392.21	At-Grade	16' Private Road Access

Contract #	Licensee Name	Purpose	MP	Type	Use Description
22078	Henry, Robert and Sylvia	Road Access	392.39	At-Grade	Private Road Access
392.39E	Schneider, Milton	Road Access	392.39	At-Grade	16' Private Road Access
392.4	Hudgens, Mark and Grace	Road Access	392.4	At-Grade	16' Private Road Access
392.5	Graber, Jess	Road Access	392.5	At-Grade	16' Private Road Access
23699	Fox	Road Access	392.58	At-Grade	16' Private Road Access
392.59	Downie, Jason & Frazier, Michale	Road Access	392.59	At-Grade	16' Private Road Access
393.15	Pitkin Iron	Road Access	393.15	At-Grade	Public Road Access
393.75	Blue Creek Ranch	Road Access	393.75	At-Grade	Private Road Access
393.9	Elk Valley Ranch	Encroachment	393.9	Encroachment	Fence Encroachment

360.49	City Of GWS	12' Wide Public Trail	Encroachment
360.50	City Of GWS	Waterline Crossing	Underground
360.61	City Of GWS	Soft Surface Trail Connection to GWSE	Encroachment
360.81	City Of GWS	Wire Line Crossing	Overhead
360.83	City Of GWS	Drainage Crossing (12th St ditch)	At-Grade
360.94	City Of GWS	Waterline Crossing (Riverside Dr)	At-Grade
361.2	City Of GWS	Public Encroachment License (Sewer)	Underground
361.25	City Of GWS	18" Sewer line Crossing	Underground
361.73	City Of GWS	Public Encroachment Flashing Signal -23rd Street	At-Grade
361.74	City Of GWS	Waterline Crossing - South Grand Ave	Underground
361.8	City Of GWS	Public Encroachment License (50' Sewer)	Underground
361.8	City Of GWS	Electrical Line - Parallel between Safeway & 23rd	Underground
361.86	City Of GWS	Waterline Crossing	Underground
362.04-362.61	City Of GWS	Electric Overhead & Underground - 27th to Rosebud	Both
362.04	City Of GWS	Waterline Crossing - 27th Street Crossing	At-Grade
362.05	City Of GWS	27th Street	At-Grade
362.21	City Of GWS	Pipeline Crossing	Underground
362.26	City Of GWS	Waterline Crossing - 29th Street	Underground
362.6	City Of GWS	2" Waterline Crossing	Underground
362.72	City Of GWS	8" Waterline Crossing - 24" Casing	Underground

Contract #	Licensee Name	Purpose	MP	Type	Use Description
	Garfield County				
	Garfield County	Road Access	363.45	At-Grade	County Road 154 (North) & Highway 82 at Buffalo Valley
	Garfield County	Road Access	363.52	At-Grade	County Road 154 (South) & Highway 82 at CMC Turn Off
	Garfield County	Road Access	366.5	At-Grade	County Road 154 (South) & Highway 82 at Iron Bridge Turn Off
	Garfield County	Road Access	371.48	At-Grade	County Road 106 and Satank Bridge
	Garfield County	Road Access	373.13	At-Grade	County Road 100 At Carbondale City Limits

Contract #	Licensee Name	Purpose	MP	Type	Use Description
	Eagle County				
	Eagle County	Road Access	378.622	At-Grade	Eagle County Public Road (Hooks Spur Rd.) S-8
	Eagle County	Road Access	378.2 - 380.3	At-Grade	Hooks Spur Road Encroachment Parallel to RR ROW

Contract #	Licensee Name	Purpose	MP	Type	Use Description
	Pitkin County				
	Pitkin County	Road Encroachment	393.3 - 393.4	At-Grade	Public Road Encroaching on RR ROW
	Pitkin County	Road Access	393.15	At-Grade	Industrial & Fishing Access at Pitkin Iron
	Pitkin County	Road Access	393.1	At-Grade	Public At-Grade Crossing - Upper River Road
	Pitkin County	Road Access	391.6	At-Grade	Public At-Grade Crossing - Lower River Road - (CR17)
	Pitkin County	Road Access	390.00 - 391.3	At-Grade	Public Road Encroaching on RR ROW
	Pitkin County	Road Access	390.7	At-Grade	Public At-Grade Crossing of Lower River Rd. (CR 16)
	Pitkin County	Road Access	390.3	At-Grade	Public At-Grade Crossing of Lower River Rd. (CR 16)
	Pitkin County	Road Access	389.1	At-Grade	Public At-Grade Crossing of Lower River Rd. (CR 16)
	Pitkin County	Road Access	387.0 - 389.0	At-Grade	Public Road Encroaching on RR ROW
	Pitkin County	Road Access	387.4	At-Grade	Public At-Grade Crossing of Lower River Rd. (CR 16)
	Pitkin County	Road Access	387.1	At-Grade	Public At-Grade Crossing of Lower River Rd. (CR 16)
	Pitkin County	Road Access	383.4	At-Grade	Public At-Grade Crossing Entrance to High School
	Pitkin County	Road Access	382	At-Grade	Public At-Grade Crossing at Emma
	Pitkin County	Trail Access	386.8 - 385.9	At-Grade	Public Trail Encroachment and Crossing at 5 Spots
	Pitkin County	Road Access	379.83	At-Grade	16' Public Trail Crossing on Hooks Spur
	Pitkin County	Road Access	379.83	At-Grade	Private Road Crossing for Pitkin County Staff
	Pitkin County	Trail Easement		At-Grade	20' Trail Easement from Emma to Woody Creek

Contract #	Licensee Name	Purpose	MP	Type	Use Description
	Town of Carbondale				
	Town of Carbondale	Road Access	372.72	At-Grade	Public Road Crossing - 8th Street
	Town of Carbondale	Road Access	372.976	At-Grade	Public Road Crossing- 4th Street
	Town of Carbondale	Road Access	373.14	At-Grade	Public Road Crossing - 2nd Street

Contract #	Licensee Name	Purpose	MP	Type	Use Description
	Colorado Department of Transportation	Road Access	372.23	At-Grade	Highway 133 - Carbondale
	Colorado Department of Transportation	Pedestrian Bridge	385.05	Overhead	Wingo Junction Bridge & Road

LIST B

PROPOSED NEW CROSSINGS THAT RFTA, CDOT, AND GOCO WILL APPROVE ON A CASE-BY-CASE BASIS.

These projects are intended to begin implementation in less than two years.

LICENSEE	PURPOSE	MP.	CROSSES RAIL	USE DESCRIPTION
Town of Carbondale	Public Road	372.7	NO	At-Grade Public Road Parallel to the RR ROW out to 8th Street
CDOT	Public Road	361.4	YES	At-Grade Public Crossing – South Bridge

LIST C

(NONE NOTED AT THIS TIME)

APPENDIX B

RFTA Rio Grande Railroad Corridor Design Guidelines

2023~~2018~~ RFTA RAILROAD CORRIDOR DESIGN GUIDELINES

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1. Policy Introduction and Overview

1.1 INTRODUCTION AND PURPOSE

These Design Guidelines (DG) are intended to help project sponsors understand, from the outset of their planning processes, how to design their projects in ways that will not create concerns for RFTA with respect to future freight rail reactivation or commuter rail uses. Subject to Colorado Public Utilities Commission (CPUC) approval, and while rail service is inactive on the Corridor, RFTA will generally approve public and private at-grade crossings that meet its DG, insofar as such crossings would not preclude or impair RFTA's ability to reactivate freight rail service. Proposed crossings that would alter the existing grade and/or alignment of the Rail Corridor would be of greater concern to RFTA, which must ensure that they would not jeopardize the Corridor's Railbanked status for the reasons enumerated above.

RFTA acknowledges that no plans, policies, or guidelines, can foresee every condition or situation that could potentially arise with respect to all proposed future uses of the Corridor. To the extent feasible, therefore, RFTA's intends that its application of these DG will be flexible enough to adapt to the unique circumstance presented by Corridor uses that are proposed in the future. RFTA will also endeavor to use a "common sense" approach when working with crossing sponsors to design their projects in the most cost-effective manner that is feasible, so long as in the view of RFTA, its legal counsel, and railroad engineers, the preservation of the Corridor's Railbanked status would not be put in jeopardy.

The Roaring Fork Transportation Authority's (RFTA's) Rio Grande Trail is the former Aspen Branch of the Denver & Rio Grande Western Railroad. RFTA owns the Trail pursuant to a Notice of Interim Trail Use (NITU) issued by the Surface Transportation Board (STB), a federal agency, in STB Docket AB 547X. Under the NITU, the Trail corridor remains under the jurisdiction of STB for possible freight railroad reactivation in accordance with 16 U.S.C. 1247(d). RFTA acquired the property from the Roaring Fork Railroad Holding Authority (RFRHA). RFRHA acquired the property for rail, including both freight and commuter rail use, and "railbanked" the property pursuant to 16 U.S.C. 1247(d). Under this statute, the property is preserved intact for possible freight (and commuter) rail reactivation and may be used as a trail and for other purposes compatible with rail and trail operation. Consistent with the foregoing, RFTA's Access Control Policy (ACP), including guidelines and procedures set forth therein, are designed to ensure that RFTA keeps the corridor intact for possible future freight rail reactivation (thus ensuring the continued applicability of 16 U.S.C. 1247(d)), as well as ensuring that the corridor can be used for future commuter rail and current and future trail and open space purposes.

So long as the corridor remains regulated under 16 U.S.C. 1247(d), it may not be treated as abandoned for rail purposes under state or local law. See also 49 U.S.C. 10501(b) (federal railroad regulatory law preempts state law and state law remedies). This precludes application of state or local laws or regulations that might sever or otherwise impair the use of the corridor for rail or trail purposes. Ultimately, RFTA's ACP is to be applied and construed to ensure compliance with 16 U.S.C. 1247(d), and to keep the Corridor intact for possible future freight and commuter rail use, and for current and future trail and open space uses.

Hereinafter, the terms “Corridor”, “Railroad”, “Railroad Corridor”, “Rail Trail”, “Right of Way (ROW)” and “Property”, all refer to the above noted Aspen Branch of the Denver & Rio Grande Western Railroad, are one and the same and used interchangeably throughout this document.

In order to ensure compliance with 16 U.S.C. 1247(d), RFTA views itself as obligated to ensure that the Corridor is kept intact, continuous, unencumbered by future financial burdens and unobstructed by significant structures that would impede or impair freight rail reactivation. This obligation is a kind of minimum condition to which all proposed uses (including crossings) of the Corridor must adhere. Maintaining the property intact for future freight rail reactivation requires that RFTA avoid any sales or transfers of interests in the corridor that cause a severance (e.g., the absence of a reasonable route for restored trackage). In addition, this goal requires RFTA to avoid allowing uses of the property for structures that amount to de facto severance of the corridor (e.g., bridges, tunnels, depressions or elevations of the railbed grade) that are inconsistent with restored freight (or commuter) rail uses.

Because rail reactivation needs are generally more stringent than trail operation needs, these guidelines focus on requirements for rail reactivation.

Relevant guidelines are set forth herein. As an indication of a crossing that is more likely to be allowed, applicants for a crossing are advised that they: (a) should avoid proposals that alter the elevation of the original railbed; (b) should avoid proposals that involve placing obstructions in the corridor that are higher than the roadbed (and, in order to protect sufficient property for a two track commuter system, as a minimum avoid placing obstructions closer than 23 feet from the centerline of the former roadbed); (c) should avoid placing any obstructions closer than 23 feet from the top rail of hypothetical tracks on the original roadbed; (d) should avoid damage to any existing subsurface uses of the property (including but not limited to fiber optics easements and uses); (e) should consolidate crossings rather than propose new at-grade motor vehicular crossings; (f) should include safety measures to protect trail users, both during construction (e.g., flaggers or warning devices) and during operation (e.g., protection of sight distances, warning signs); and (g) should hold RFTA harmless from increased costs or liabilities arising from a proposed third party use of the property.

To the maximum extent feasible, all proposed uses should be rail-compatible, and project sponsors are generally responsible for the cost of their proposed uses unless RFTA voluntarily agrees to share costs or the CPUC allocates a portion of the costs to RFTA. At the time of any rail reactivation, RFTA also reserves the right to modify third party uses of the corridor upon rail reactivation but will endeavor to do so in a manner that is fair and equitable. Finally, any third-party user is responsible for all damages arising from its use either to the trail, to users of the trail, or to any other permitted use on RFTA’s property.

There may be certain current third-party uses of the RFTA property that do not conform to these guidelines. These non-conforming uses are not precedent for deviation from the policies embodied in these guidelines. On a case-by-case basis, RFTA will endeavor to remove or to ameliorate the non-conforming uses to the extent consistent with applicable contracts and legal requirements.

1.2 DEFINITIONS

The following definitions and concepts apply to this document:

PUBLIC ROAD CROSSING: For a public crossing, the roadway must be part of the general system of public roads, and under the jurisdiction of and maintained by a public road authority, and open to the

general traveling public. For a public at-grade crossing, usually, both roadway approaches are maintained by a public road authority. The statutory definition of a public crossing is defined in 49CFR Part 234.5(a), in 23 CFR Part 460.2, and in the Rail Safety Improvement Act (RSIA) of 2008, Section 204. It is also defined in Section 1.0 of the "Highway-Rail Crossing Inventory Instructions and Procedures Manual," dated December 1996, and can be found on the Inventory Program Website at http://www.fra.dot.gov/us/content/801. New public crossings and changes to existing public crossings require approval by RFTA consistent with RFTA's ACP and these guidelines and, to the extent the Colorado Public Utilities Commission (CPUC) has jurisdiction over railbanked trails, require approval by the CPUC, and a license, agreement, or easement from RFTA.

PRIVATE ROAD CROSSING: All intersections of railroad tracks with roadways that are not public crossings are considered private crossings. Private highway-rail grade crossings are on roadways not open to use by the public nor maintained by a public entity. The Trail corridor is a railbanked rail corridor. Railroads require control of crossings for safety reasons. Railroads do not recognize private crossings unless permitted under a written agreement between the landowner and RFTA. No private crossings are permitted except pursuant to a written license agreement with RFTA, or a predecessor of RFTA. Typical types of private crossings are as follows:

- Farm crossings that provide access between tracts of land lying on both sides of the railroad (trail) right of way.
- Industrial plant crossings that provide access between plant facilities on both sides of the railroad (trail) right of way.
- Residential access crossings over which the occupants and their invitees reach private residences from another road, frequently a public road paralleling and adjacent to the railroad (trail) right of way.
- Temporary crossings established for the duration of a public or private construction project or other seasonal activity.

Railroads traditionally allowed private crossings only by 30-day terminable licenses. In order to protect the corridor in a fashion compatible with rail reactivation, RFTA intends to continue that practice. Adjoining landowners are advised that sales of real property adjacent to the RFTA right of way corridor do not imply that the successor in interest to the adjoining landowner shall have an automatic right to cross the Railroad Corridor. Failure by the new landowners to acquire a license agreement/contract/permit with RFTA may result in denial/revocation/ removal of the private crossing. Change in use of the crossing may also result in the requirement to upgrade the crossing improvements or revocation/removal of the crossing and improvements. RFTA will not unreasonably withhold the issuance of new licenses to new owners when properties are sold as long as such licenses are consistent with the ACP and DG.

PEDESTRIAN / BICYCLE /TRAIL CROSSING: There are two kinds of pedestrian and bicycle crossings relevant to the RFTA rail trail corridor. First, for railroad purposes, a pedestrian crossing is defined as any location where the pedestrian leaves the sidewalk/trail and enters the railroad right of way. However, RFTA's corridor is currently in use as a pedestrian and bicycle trail. In general, RFTA will still require a permit for a private pedestrian or a bicycle crossing in order to ensure, inter alia, that the user protects RFTA from liability arising from his/her use of the private crossing and, in addition, that the user

does not propose a crossing that will contain an obstruction precluding rail reactivation. Consistent therewith, all users of private pedestrian or bicycle crossings should note that their use may be terminated (without cost to RFTA) or altered (without cost to RFTA) in the event of rail reactivation. In the event of rail reactivation, detailed measures (including right angle at-grade crossings, flangeways, or grade separation) will be required for any private pedestrian or bicycle crossing that is not terminated.

Second, and most important for the time being, RFTA is operating a pedestrian and bicycle trail on the corridor in accordance with 16 U.S.C. 1247(d). This trail will cross certain public and private motor vehicular crossings of the former railroad corridor. RFTA will require all public and private motor vehicular crossings to incorporate site-specific safety measures for the protection of trail users. For any significant new public or private crossing, this may include signage, gates, grade separation, sight distance requirements, and other measures. Because these guidelines focus on an operating railroad, there may be some points of confusion as to whether a guideline relates to a trail crossing the RFTA rail trail right of way, or the trail on the right of way. Unless RFTA determines otherwise, the rail guidelines herein govern trails crossing a rail line once the rail line is reactivated for rail use. RFTA's rail trail stands in for the former operating freight railroad.

HIGHWAY-RAIL GRADE CROSSING: Commonly known as "at-grade crossings", they are generally where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade. All other intersections of railroad tracks with roadways are considered private crossings.

GRADE SEPARATED CROSSING: A railroad, highway, or trail intersection using an overpass or underpass structure that uses elevation profile to avoid a direct connection between two physical alignments. Grade-separated crossings can be public or private.

UTILITY CROSSING: Any utility line, permanent or temporary, pipeline or wireline crossing over or under any track alignment in the rail corridor is to be considered a utility "crossing". Any utility on the railroad corridor not passing over or under those same track alignments shall be considered a utility "encroachment".

Utilities are generally private crossings and encroachments in nature, covered by a license agreement with RFTA. Subject to mutually agreeable terms and conditions, however, easements for utilities can be granted to public agencies and utilities.

Utilities include lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, stormwater and other similar commodities which are privately, publicly or cooperatively owned and which serve directly or indirectly the public or any part thereof. Various types of utility lines not specifically discussed herein shall be considered within the provisions of this policy. It shall be the general practice to consider all lines carrying caustic, flammable or explosive materials under the provisions for high- pressure gas and liquid fuel lines as a utility.

Utility lines crossing RFTA's Railroad Corridor in public road corridors are not exempt from RFTA's ACP and from the requirement that the utility using the crossing obtain a license, agreement, or easement from RFTA. No utility may be installed without a prior license, agreement, or easement from RFTA. RFTA reserves the right to deny a license, agreement, or easement even if the utility obtains a license from a

public road authority or another third party. Highway signal and signal line installations are also subject to RFTA licensing requirements and should be consistent with all applicable guidelines, including meeting or exceeding casing depth, clearance (side and overhead) and railroad safety standards. In the event of rail reactivation, utilities (including highway utilities) may need to be moved or altered, and if so, this will be subject to the terms and conditions of the license, agreement, or easement issued to the entity using the utility facilities.

1.3 LEASE / LICENSE/ CONTRACT APPLICATION PROCESS

Overview:
The process of gaining review and approval for any improvement in the RFTA Corridor shall be through an application for a renewal or new lease, license, contract, easement, or another form of agreement with RFTA. The application process is relatively the same for crossings, both private and public entities, as well as encroachments and is summarized below.

The application process is intended to provide RFTA with general information on the applicant, the proposed improvement, its location, other relative information that is required for RFTA to assess compliance with the ACP, these Design Guidelines, and other special criteria outside of those documents determined at the discretion of RFTA.

The application and approval process is applied to the following types of improvements in the RFTA corridor. Special uses or improvements not listed shall be included in the Miscellaneous Encroachments category.

A. Private Crossings
   a. Private Roadway & Trail Crossings
   b. Private Utility Crossings
   c. Private Encroachments

B. Public Crossings
   a. Public Road Crossings
   b. Public Utility Crossings
   c. Encroachments
   d. Public Trail/ Pedestrian/Bicycle Crossings

C. Miscellaneous Encroachments
   a. Signboard
   b. Environmental Access
   c. Seismograph/ Geophysical Temporary Access
   d. Survey/Engineering Temporary Access

The application process involves the preparation and submittal of multiple forms, with an increasing level of detail, tailored to the information needed for the specific use involved in the project seeking approval from RFTA, starting with general information about the applicant and the proposed project.

Application Process Summary:

The process of submitting for review and approval of the above-noted projects by RFTA is summarized below. Additional information and detail are provided for each specific application by type of improvement or use following this summary. The expected minimum duration times to process and grant the lease, license or contract agreement are noted in each specific type of application on the following pages of this section.

1. Review the ACP, Design Guidelines and Standards, and other related policy information from RFTA, available online at www.rfta.com.
2. Once the above-noted policies, criteria, requirements and other pertinent information have been reviewed and understood, to the extent possible, contact the RFTA Assistant Director, Project Management & Facilities Operations at 970-384-4982 to schedule a pre-application meeting with a RFTA representative to be assigned to your submittal.
3. Fill out the forms G-1, G-2, G-3 (checklist), G-4 if applicable, review G-8, and prepare a cover letter for the submittal providing a written description (narrative) of the purpose and scope of the project, preferably with a conceptual or preliminary sketch or design drawing, if available.
4. Meet with the RFTA representative (pre-application meeting) assigned to your submittal to review the details in your application and any follow-up explanation necessary. RFTA will then let you know which additional forms are required for additional information needed to review and process your application. RFTA will require a letter of reimbursement in order to begin the application review process. Full payment of the applicable application fee is required at the ~~time of submittal of the initial application, no later than at the pre-application meeting.~~end of the review process once a license agreement is put in place.
5. Fill out and provide the additional information requested to your RFTA representative, if requested.
6. RFTA will then review the entire application and process the application. If supplemental information is requested, that information shall be included in the application file and become part of the application.
7. RFTA will either make a determination of acceptance and grant the lease, license, easement, or contract agreement, or deny it. If the application is denied, a summary determination letter will be provided listing the reasons for the denial.
8. Execute the lease, license, easement, or contract agreement with RFTA.
~~8.~~9. Once the license agreement is in place, RFTA will issue a permit to begin work on the project. An as-built will be required and will be ~~to~~ attached as an exhibit to the license agreement once the project has been completed.

Please note: If the applicant seeks to appeal the determination, the applicant must follow the process set forth in Chapter III, Section 17 – "Permits for New Crossings and Consolidations" of the ACP.

The applicant must fill out the following forms in all cases:

FORM G-1: **General Information/ Contact Sheet(s)** – Identifies ALL of the applicant's principal contacts, agents and consultants. This contact information will have multiple uses inside RFTA's management database system over the life of the lease/contract/license.

FORM G-2: **Applicant Site Location** – Identifies the location of the proposed crossing/ encroachment on RFTA's Rio Grande Rail/Trail property using several different methods of locating the area in relation to the public record. Later, a detailed sketch/ survey will be requested by RFTA to accurately tie down the location as shown in Section 11 of these Design Guidelines and Standards (DG). All of this information will become part of RFTA's Geographic Information System (GIS) database and emergency management system.

FORM G-4: **Great Outdoors Colorado (GOCO) Conservation Area Impact Assessment** -Identifies any possible conflict areas, in conjunction with form A-2, and the nine (9) Conservation Restriction Areas set forth in the Conservation Restriction Agreement noted in the ACP. The nine (9) separate conservation areas are listed on Form G-4. If the application area resides inside any of these nine GOCO conservation areas, RFTA's Assistant Director, Project Management, Facilities Operations will provide advice and direction as to how to proceed or not, with an application in one of these restricted areas.

RFTA's responsibility to preserve the freight rail corridor and to comply with the GOCO Covenant Restriction Agreement is vital to the future viability of the Rio Grande Trail and the communities that RFTA serves. An explanation of the GOCO covenant restrictions can be found in sections 1 (GOCO) and II.8 of the ACP.

In these Design Guidelines, there are eight (8) general purpose forms (G-Series) and six (6) specific to the type of application forms (A-Series) for use in the application process. These forms are for the gathering of basic information for RFTA's processing of the application and future use. In addition, the applicant shall provide additional information in drawing and narrative/letter form better explaining their request of RFTA for joint occupancy or use of its corridor. In some places, such as the Union Pacific Freight Rail Easement in Glenwood Springs, additional review and approvals may be required from additional entities such as Union Pacific, CDOT, or the CPUC. RFTA will provide coordination assistance to the applicant related to any such required additional entity review and approvals. Federal, State, County or Municipal Land Use Approval Processes may also be required and are to be considered as separate to the RFTA Processes.

The process approval timeline begins with the submittal of all of the fully completed forms and documents required, and completion of the pre-application meeting. Prior contact without completion of the forms and requested documents does not constitute an earlier timeline start-date. All correspondence and communication regarding the project submittal must be in writing, either hard copy or digital email. All verbal communication will not be considered a part of the submittal and review process.

Upon completion of the pre-application meeting, receipt of a completed final submittal by the applicant, and receipt of the application fee reimbursement letter, RFTA will review the submittal documents to date and prepare a list of exceptions to be returned to the applicant, generally within 1 - 3 weeks, depending on the complexity of the project. The revised submittal package, including clarifications, corrections, and edits are due back to RFTA within ten (10) working days, or on a schedule as agreed to with RFTA. Any additional delay will result in a delay in approval of the submittal and

permission to access RFTA property for the purposes requested. Please advance final design review documents if required, to RFTA as soon as possible as these normally become time sensitive towards working out an approved agreement (along with insurance and legal matters) and start of construction (at license contract approval).

Additional information may be requested by RFTA to answer questions raised by its staff or agents, such as, but not limited to:

- Environmental Issues
- Drainage Issues
- Hazardous Materials Operations
- Health & Safety
- Noise and/or Light Pollution
- Traffic Density / Studies (Truck & Vehicle Counts)
- Emergency and Fire Services Mitigation

If the returned submittal package is acceptable to RFTA, the applicant will be notified of the approval of the re-submittal. The lease, license, or contract agreement draft will be provided within one week following notification of approval.

If secondary (or more) submittals are required due to design changes, the inability to comply with the ACP and Design Guidelines, or for other reasons, the above-noted review schedule shall be repeated, until a conclusion is obtained.

Under no circumstances will any LICENSE/PERMIT/EASEMENT/CONTRACT operation be allowed to commence without proper completion of the Contract Document(s). Verbal permissions will not be granted. All permissions must be obtained from the RFTA Assistant Director, Project Management & Facilities Operations or his/her designee.

RFTA reserves the right to reject any application based on its merit, compliance with the law, compliance with local and national regulation, compliance with GOCO covenant restrictions or the discretion of RFTA's Board of Directors or staff.

Overnight and rush approvals of contract/license/lease applications are not normally possible and strongly discouraged. Increased application fees will apply if the rush processing of applications is required. All applications are handled with the same attention to review submitted materials. Time is required for input from various levels of its organization and possibly that of the RFTA Board of Directors. In the case of GOCO covenant areas, additional input will be needed in most cases before an opinion is rendered on the application. You will be notified if such additional approvals are required and the estimated additional time required to obtain those approvals. RFTA is not liable for any such delays.

RFTA understands that applications submitted to RFTA may also be subject to review and comment by local jurisdictions outside RFTA's Control. The timing of the response and approvals by those outside entities may further delay any approval by RFTA.

The following general process thumbnail descriptions outline the application process in most cases and provide some questions to identify specific items that should be addressed as part of the proposed plan submittal. RFTA realizes that there are always unique instances where specifically following the general process requirements either cannot be met or won't apply. Please contact RFTA's Assistant Director, Project Management & Facilities Operations in cases where the standard approach is shown may not apply for further instruction. The application fees noted do not include special site visits or inspections or other meetings required, other than as noted below. If required, additional application fees will apply, to be determined at the pre-application meeting.

A.) PRIVATE CROSSING & ENCROACHMENT APPLICATIONS

All private crossing and encroachment applications are to be revocable contracts between RFTA and the applicant. In general, RFTA will not consider an easement in lieu of a license agreement, contract or lease.

1. PRIVATE ROAD CROSSING -RESIDENTIAL

All Private Residential Road Crossings/ encroachments must include the forms listed below, a Plan & Profile plan set, paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

- Refer to RFTA Design Guidelines, Sections 2.1 & 5 for additional information
- FEE: $TBD- See Form G-8 for related fees.
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30 - 60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-6, G-8 ~~(plus submittal fee)~~, G-10. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 5, 9, and 11, and must comply with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

2. PRIVATE ROAD CROSSING –COMMERCIAL INGRESS & EGRESS

All Private Commercial Road Crossings/ encroachments must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

- Refer to RFTA Design Guidelines, Sections 2.1 & 5 for additional information
- FEE: $TBD - See Form G-8 for related fees.
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-6, G-8 ~~(plus submittal fee),~~ G-10. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines and Standards, noted in Sections 1, 2, 5, 9, and 11, and must comply with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

3. PRIVATE UTILITY CROSSINGS

All Private Utility Crossings must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

<u>WIRELINE CROSSING (AERIAL)</u>

- Refer to RFTA Design Guidelines, Sections 2.2 & 3 for additional information
- FEE: $TBD - See Form G-8 for related fees.
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days

- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-8, A-2, A-6, and A-3, ~~plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 3 and 11, and must be consistent with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right-of-way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

4. UNDERGROUND PIPELINE UTILITY CROSSING (Oil, Gas, Water, Sewer, Drainage, Fiber Optic)

All Private Pipeline Crossings/ encroachments must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

- Refer to RFTA Design Guidelines and Standards, Section 3 for additional information
- FEE: $TBD – (See Form G-8 for related fees). Actual fee is dependent upon pipe casing size and commodity carried. Additional public agency involvement may be required.
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-8, A-2, A-3, and A-6~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 3 and 11, and must comply with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and

Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

5. ENCROACHMENTS (VARIOUS)

All private encroachments must include the forms listed below, a Plan & Profile plan set paper copy, where applicable, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

The minimum fees for processing encroachment applications vary by the type and use of RFTA's property. Please be sure to explain the conditions of use for the license/contract/lease as applied to the encroachment in the application narrative letter.

Fees: $TBD Signboard/ Media
$TBD Lineal Encroachments/ Fenceline, et al
$TBD Firebreak & Agricultural Use
$TBD Structural Encroachments
$TBD Parking Lots, site storage, etc
$TBD Surface Drainage
$TBD Combination of the above
(to be established at the pre-application meeting)

- Refer to RFTA Design Guidelines, Section 7 for additional information
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, and G-8~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 5 and 11, and must comply with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

B.) PUBLIC ROAD CROSSINGS & ENCROACHMENTS

1. PUBLIC ROAD & TRAIL CROSSINGS

All Public Road and Trail Crossings must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

- Please refer to Design Guidelines, Sections 2, 4, 5, 6 and 11 as required.

Minimum Fee: $TBD RESIDENTIAL ACCESS/ Per iteration
$TBD MAJOR ARTERIAL / Per iteration(*) Additional fees and iterative reviews may be dependent on the size of the project and negotiation between RFTA and the roadway agency.

If bridge overpass or underpass is involved, additional fees for bridge inspection, plan & design review is required at time & material rates. Railroad bridges require more extensive review. (Nominally 1.5 times the highway typical costs unless the railroad bridge materials are pre-engineered UP or BNSF standard design bridges). The applicant shall negotiate fees with RFTA Assistant Director, Project Management & Facilities Operations based on the size and scope of the project. In addition, the applicant may also be required to submit for approvals to the Colorado PUC, Union Pacific (only in the Glenwood Springs Freight Rail Easement (Wye and tail track) north of 19th Avenue), after obtaining approval from RFTA.

Approvals of all public crossing applications or public road encroachments are required by the Colorado Public Utilities Commission – Rail Safety & Engineering Division in written form. (See 4CCR723-7; Sections 7002(d) and 7203. Written form as described in the Application/Decision process)

- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Processing timeframe: 60-90 days (two iterations), plus Colorado PUC approval
- Local public agency or government sponsor? If no, the application may be tabled.
- REQUIRED FORMS: G-1, G-2, G-4, G-5, and G-8~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 4, 5 and 11, and must be consistent with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?

- Are the submittal drawings in compliance with the information provided on the application forms submitted?

- Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

ONE DESIGN & APPLICATION REVIEW ITERATION CONSISTS OF:

1. Initial Submittal of Documents
2. Design Review of Documents
3. Response to initial submittal documents with comments
4. Re-submittal by applicant
5. Checking for compliance and corrections, and if satisfied that all comments have been addressed adequately, issuance of approval.
6. Permit issued to begin work on project once approved.

Please note - In the event that the re-submittal is unsatisfactory and approval has not been granted, subsequent re-submittal reviews and any additional work beyond step 5 by RFTA and its agent(s) will be provided on a time and materials basis. Fees will be charged whether the application to RFTA was approved or not.

2. PUBLIC UTILITY CROSSINGS

All Public Utility Crossings Must Include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

WIRELINE CROSSING (AERIAL)

- Refer to RFTA Design, Sections 2.2 & 3 for additional information
- FEE: $TBD - See Form G-8 for related fees.
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-8, A-2 and A-3~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 3 and 11, and must be consistent with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?

- Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
- Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

3. UNDERGROUND PIPELINE UTILITY CROSSING (Oil, Gas, Water, Sewer, Drainage, Fiber Optic)

All commercial pipeline crossings/ encroachments must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

- Refer to RFTA Design Guidelines, Section 3, for additional information
- Fee: $TBD, actual fee is dependent on pipe casing size and commodity carried. Additional public agency involvement may be involved.
- Please state if this is an upgrade or change to an earlier existing contract(s). If there are existing utilities to be retired, RFTA will request removal (if possible) of the existing utility pipeline or filling of the pipeline with an acceptable polymer flow material for structural and safety reasons. Undocumented pipeline utilities not in use shall be removed immediately and undocumented pipelines in use are subject to fine from RFTA and the Colorado PUC per 4CCR723-4.
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-8, A-2 and A-6~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?
- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 5, 7, 8, and 11, and must be consistent with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

- Please check for conflicts - Ditch companies and irrigation companies will provide RFTA with relevant DWR water rights information, including adjudicated ditch rights case numbers water divisions and water districts. http://water.state.co.us/SurfaceWater/SWRights/Pages/default.aspx

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

4. ENCROACHMENTS (VARIOUS)

All commercial encroachments must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

The minimum fees for processing encroachment applications vary by the type and use of RFTA's property. Please be sure to explain the conditions of use for the license/contract/lease as applied to the encroachment in the application narrative letter.

Fees: $TBD Signboard/ Media
$TBD Lineal Encroachments/ Fenceline, et al
$TBD Firebreak & Agricultural Use
$TBD Structural Encroachments
$TBD Parking Lots, site storage, etc
$TBD Surface Drainage
$TBD Combination of the above
(to be established at the pre-application meeting)

- In the case of many municipal uses, a case-by-case approach will be required, especially where public safety or public necessity is involved. In certain cases, additional approval by the RFTA Board of Directors may also be required. Because some public works funding streams may require an easement, RFTA may grant easements subject to mutually agreeable terms and conditions approved by the RFTA Board of Directors.
- RFTA's duty to protect its GOCO covenants and freight rail obligations may preclude the joint use of certain pieces of real estate in the rail corridor.
- Signboard/ Advertising Companies will have to provide RFTA with sizing (8-sheet/30 sheet/Bulletin etc. plus electrical & lighting plans, birdwackers, etc. plus foundation requirements, vision/obstruction measurements and a county planning referral number)
- Refer to RFTA Design Guidelines, Sections 7 & 11 for additional information
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, G-8, and G-10~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?

- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines and Standards, noted in Sections 1, 2, 5 and 11, and must be consistent with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines and Standards, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?

Separate forms will be required as part of the submittal package for any utilities placed as part of the project (Gas, Water, Sewer, etc.).

5. ENCROACHMENTS (OTHER)

There are multiple occasions where license lease and contract requests will not fit into a general road & trail crossing, utility or long-term lease of land/ encroachment scenario. Many of these are temporary in nature or for aesthetic / non-physical purposes. These will be considered as special use requests with a fee that shall be determined by RFTA on a case-by-case basis, depending on the narrative submitted and the nature of the application.

All encroachments must include the forms listed below, a Plan & Profile plan set paper copy, and PDF digital copy initially, however, RFTA may also require CAD files of design drawings in DGN (Microstation) or DWG (AutoCAD), including plot file data (.ctb) etc. at time of submittal. The final submittal and approval package shall include the CAD files, as well as hard copy and PDF for inclusion into RFTA's GIS database system.

The minimum fees for processing encroachment applications vary by the type and use of RFTA's property. Please be sure to explain the conditions of use for the license/contract/lease as applied to the encroachment in the application narrative letter.

FEE ESTIMATED RANGE: $TBD (MISC. APPLICATION)

- Refer to RFTA Design Guidelines, Sections 7 & 11 for applicable additional information
- State whether or not the application is for an upgrade or change to an earlier existing contract(s)
- Estimated processing timeframe: 30-60 days
- REQUIRED FORMS: G-1, G-2, G-4, G-5, and G-8~~, plus submittal fee~~. Are all of the applicant's forms complete, especially contact information?

- REQUIRED DRAWING: Plan & Profile drawing meets all applicable criteria shown in RFTA's Design Guidelines, noted in Sections 1, 2, 5, 7, and 11, and must comply with RFTA's ACP. (At final approval, CAD files of the drawing(s) will be required for entry into RFTA's GIS records system.)
- Drawing submittal information checklist – please confirm and address prior to submittal:
  - Does the construction plan show any activity required outside of the requested limits or RFTA's right of way?
  - Does the drawing show anything in conflict with the existence of other contract documents that the applicant is aware of?
  - Are the submittal drawings in compliance with the information provided on the application forms submitted?
  - Is the design data submitted with the application in compliance with the horizontal and vertical datum requested by RFTA, set forth in Section 11 of the Design Guidelines, including the reference vertical datum for overhead, underground, vertical or lateral side clearance data shown on the drawings?
  - As part of the drawing or sketch, RFTA needs to have a narrative attached explaining (in detail) what is involved and why the applicant believes that RFTA will be encroached upon or otherwise impaired.

ALL SUBMITTALS:

During the application process, RFTA may ask for older copies of existing license agreements with the Railroad (former owner) that may not have been provided at the time of sale to RFTA'S predecessor Roaring Fork Railroad Holding Authority (RFRHA). In some cases, there may be a discrepancy with the records on file with RFTA. The railroad contract documents are usually not on file in any courthouse (Railroad Federal Exemption & Elkins Act). RFTA, as successor to the railroads, will honor the earlier agreements, however, needs to know the terms and conditions of such documents, if any. At the time of expiration or renewal of these License Contracts, RFTA reserves the right to change terms and conditions in order to meet new engineering and safety standards, insurance requirements and similar changes that have taken place since the preparation of the previous documents(s).

FORM INDEX

G-1 General Information Sheet
G-2 Applicant Site Location
G-3 Submittal Checklist
G-4 GOCO -- Conservation Area Impact Assessment
G-5 Insurance Requirements/Bonding
G-8 Fee Structure
G-10 General Road/Trail Crossing Application
G-11 Permit Application Form
G-12 Revegetation and Restoration Form

SUBMITTAL GENERAL INFORMATION SHEET

From: (applicant to be party placed under contract)

Name:

Address:

City-State-Zip:

Phone: Emergency Phone:

Cell: Email:

TAX ID:

EXISTING RFTA CONTRACT? YES ☐ NO ☐ CONTRACT NO.

☐ PUBLIC AGENCY

☐ PRIVATE PARTY

☐ COMMERCIAL

☐ INDUSTRIAL

☐ RESIDENTIAL

☐ UTILITY

☐ OTHER

US/UCC STATUS

	STATE	ID NUMBER
☐ INDIVIDUAL		
☐ LLC		
☐ PC		
☐ LLLP		
☐ LLP		
☐ LPA		
☐ LP		
☐ PC		
☐ SOLE PROPRIETORSHIP		

Applicant Agent & Consultant Information (if applicable)

Applicant's Agent: (Point of Contact)

Name:

Firm:

Address:

City: State: Zip:

Phone: Cell phone:

Email:

Comment:

Consultant(s): (Point of Contact)

Name:

Firm:

Address:

City: State: Zip:

Phone: Cell phone:

Email:

Comment:

APPLICANT SITE LOCATION

City: County:

State:

Street Address:

☐ Actual ☐ Approximate

COUNTY ASSESSORT PARCEL NO

(Adjoining RFTA Corridor)

RFTA Milepost Location

Section Township Range

Geographic Location

N W DATUM SOURCE

STATE PLANE COORDINATES

N E ZONE:

* NOTE: Survey Sketch and ties to RFTA control documentation will be required. Furnish as separate document.

☐ Exhibit attached (see Design Guidelines Part, PG

UTILITES /ASSET PROTECTION:

Prior to any work upon or occupation of RFTA Property, for any purpose, Buried and Aerial Utilities must be located (RFTA Rule & State Law).

Colorado UNCC/811 ~ 1.800.922.1987 ~ www.colorado811.org

Locate Request Ticket #

Union Pacific Fiber Optic & Signal Asset Protection ~

1.800.336.9193 Ticket #
(North of 19th Avenue in Glenwood Springs Only!)

CORRIDOR LAND SURVEY PLATS

Garfield County Clerk & Recorder
Glenwood Springs, CO (via Clerk & recorder or GIS)

	County#	RFTA
Glenwood Spring Segment	LSP_____	LSP 004
Red Canyon Segment	LSP 784	LSP 005
Cattle Creek Segment	LSP 785	LSP 013
Satank Segment	LSP 786	LSP 007
Carbondale Segment	LSP 789	LSP 008
Narrows Segment	LSP 788	LSP 003

Same *

Rock Bottom Segment LSP 788 LSP 003

Centerline Survey (12 sheets, 24662 Gable)
(Garfield Co. 2/15/06) _____ TCS 002-013
LSP 003

Eagle County
Eagle, CO (via County Engineers Office)

El Jebel Segment	LSP 704-715 (Individual sheets)	LSP 009
Centerline Survey (02/15/06)	_____	TCS 009

Pitkin County
Aspen Colorado (Clerk & Recorder)

Basalt Segment	_____	LSP 010
Bates Segment	_____	LSP 011
Snowmass Segment	_____	LSP 012
Centerline Survey	_____	TCS 009-013

CHECKLIST OF RFTA LICENSE/LEASE/CONTRACT APPLICATIONS

1.) Initial Application

☐ Form G-1: General information sheet. Please identify who the Applicant, its agent's (if any) and its consultants (if any) and provide RFTA contact information for all involved.

☐ Form G-2: Applicant site location form attach if at all possible, a site location sketch showing the site and purpose of the application. Incorporate as many of the location parameters in Form G- 2 as reasonably possible.

☐ Form G-4: Is the applicant's site location is inside the limits of a conservation area impacted by Great Outdoors Colorado (GOCO). If yes, RFTA needs to investigate if it can reasonably accommodate the applicant's request while still protecting the integrity of the corridor and GOCO's covenant restrictions.

☐ A written description (narrative) of the purpose and scope of the application, preferably with a preliminary sketch or plan-set with a rudimentary design developed to-date.

☐ Form G-8: Fee Schedule estimate and check for the Fee Amount.

Please remember that RFTA is under no obligation to start a review of the application until the application fee reimbursement letter and all of the requisite forms and design plans/technical information and completed forms are received by RFTA.

2.) Follow-Up Documentation

☐ 100% Design Review plan-set on any improvements to RFTA controlled property.

☐ Form G-7: Any related land use application for properties adjoining RFTA property (city, county, state levels, including local roads and highways). Shows the relationship of RFTA application to adjoining applications.

☐ Form G-6: Consistency with design guidelines suggested standards.

☐ Complete Task Specific Forms in Design Guidelines

- ☐ Underground utility crossings and/or encroachments require form(s) A-1, A-6.
- ☐ Drainage crossings require portions of Form A-1.
- ☐ Overhead wireline crossings require Forms A-2 and A-3.
- ☐ Environmental access requires Form(s) A-4 – Access Sheet, Work Plan
- ☐ Geophysical/Seismographic access requires Form A-5.

☐ Public/Private road crossings require a detailed plan and profile drawing plan-sets that are consistent with Design Guidelines and Access Control Plan.

☐ Public Trail and road crossings require compliance with Colorado PUC statute requirements (4CCR223-7) and providing PUC with letter agreements with all road agencies, trail agencies, and railroads.

☐ Form G-5: Insurance requirements and certified proof of insurance forms attached.

☐ Updated Forms G-6, G-7 with current City/County/State land use permits from adjoining applications to match RFTA's land use forms and requirements (linkage for the record).

☐ Update Forms G1, G2, G4 if requested by RFTA after initial submittal.

☐ Location of physical improvements using RFTA control documentation tied to DRGW/Rio Grande Trail Milepost data. If possible using:

RFTA State Plane coordinates.

RFTA drawing file software version DG-Section 11, survey requirements.

Purpose: Inclusion of Lease/Contract/License Data into RFTA GIS system for uniform Records Management, Risk Management and Public Safety Applications.

GOCO CONSERVATION AREA IMPACT ASSESSMENT

- Conservation area #1 – Garfield County — MP 2.68-MP 3.64 S. Glenwood Springs-Red Canon DRGW. 362.88-363.84
- Conservation area #2 – Garfield County — MP 5.22- MP 6.25 ORRISON SPUR DRGW. 365.42-366.45
- Conservation area #3 – Garfield County — MP 8.28 – MP 8.78 Cattle Creek DRGW. 368.48-368.98
- Conservation area #4 – Garfield County — MP 10.28- MP 11.07 Satank-Kiggins Spur DRGW. 370.18-371.27
- Conservation area #5 – Garfield County — MP 11.47- MP 11.61 Carbondale River Crossing DRGW 371.69-371.81
- Conservation area #6 – Garfield & Eagle Counties — MP 15.92 –MP 21.60 Catherine Stor~~ea~~ –Hooks ~~Pour~~ Spur DRGW 376.12 – 371.81
- Conservation area #7 – Eagle & Pitkin Counties — MP 21.97 – MP 24.88 Emma –Wingo DRGW 382.19- 385.10
- Conservation area #8 – Pitkin County — MP 25.26-MP 27.83 Wingo – Rose Spur DRGW 385.48 – 388.05
- Conservation area #9 – Pitkin County — MP 30.36 – MP 33.45 Sopris Forest Lt. – Woody Creek DRGW 390.58 – 393.67

☐ Is the Application area in any of the nine described locations? If "Yes", which conservation area?

☐ Does this application involve any of the following in a GOCO Conservation area?

☐ Construction of buildings and/or other structures?

☐ Fences (New or re-built/rehabilitated?)

☐ New crossings, structures or crossing improvements/upgrades?

☐ Harvesting of Timber?

☐ Mining?

☐ Paving and/or road and trail construction?

☐ Trash or storage of materials?

☐ Weeds or disturbed vegetation? (per RFTA integrated weed management plan)

Other:

* Per 2012-2013 GOCO Agreement

Proposed Mitigation:

* Note: Per conditions of the covenant (6-1-96), at purchase of Rio Grande Trail Corridor Per "Great Outdoors Colorado Trust Fund and RFTA Code Enforcement Commission ((GOCO))

RFTA INSURANCE/RISK/BONDING REQUIREMENTS
(TBD by RFTA Risk Manager)

☐ Requires Workmen's Comp., proof of insurance

☒ Requires RFTA named as additional insured policy

☐ Requires proof of vehicle insurance liability

☐ Requires Railroad Protective Policy (RPP) – UPRR Freight Rail Easement

☐ Other

☐ Contractor contact information and subcontractor contact information (attached).

☐ Contractor Registration for State of Colorado. Colorado License:

Please attach registration for Colorado Contractors and Sub-Contractors

☐ Please include Certified Proof of Insurance for subcontractors (if any) along with Contractor Proof of Insurance.

∗ Please attach Proof of Insurance.

(1) Commercial General Liability Insurance

- Pipeline, Overhead Pipe Truss or Conveyor System: Contractual Liability with a combined single limit of a minimum of $5,000,000 each occurrence and an aggregate limit of at least $10,000,000
- Electric Supply, Communication or Telephone Line: Contractual Liability with a combined single limit of a minimum of $2,000,000 each occurrence and an aggregate limit of at least $4,000,000.
- Temporary Occupancy: Contractual Liability with a combined single limit of a minimum of $2,000,000 each occurrence and an aggregate limit of at least $4,000,000.
- Public and Private Crossing: TBD- Please Arrange Meeting w/ RFTA Risk Management

  $2,000,000 each occurrence and an aggregate limit of at least $4,000,000. To be spelled-out in contract language. Licensee is liable for all vehicles using private crossing by contract terms.
- Structures/Fence/Encroachments (Long Term): Contractual Liability with a combined single limit of a minimum of $2,000,000 each occurrence and an aggregate limit of at least $4,000,000.

(2) Business Automobile Insurance

- Pipeline, Overhead Pipe Truss or Conveyor System: Combined single limit of at least $1,000,000 per occurrence.
- Electric Supply, Communication or Telephone Line: Combined single limit of at least $1,000,000 per occurrence.
- Temporary Occupancy: Combined single limit of at least $1,000,000 per occurrence.
- Public and Private Crossing: TBD- Please Arrange Meeting w/ RFTA Risk Management

- General License/ Drainage: Combined single limit of at least $1,000,000 per occurrence.
- Structures/Fence/Encroachments (Long Term): Combined single limit of at least $1,000,000 per occurrence.

(3) Workers Compensation and Employers Liability Insurance

- Pipeline, Overhead Pipe Truss or Conveyor System: Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.
- Electric Supply, Communication or Telephone Line: Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.
- Temporary Occupancy: Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.
- Public and Private Crossing: TBD- Please Arrange Meeting w/ RFTA Risk Management
- General License/ Drainage: Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.
- Structures/Fence/Encroachments (Long Term): Employers' Liability with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee. (Commercial/Industrial use only)

(4) Railroad Protective Liability Insurance

- Pipeline, Overhead Pipe Truss or Conveyor System: Coverage of at least $5,000,000 per occurrence and $10,000,000 in the aggregate. (UP and RFTA named as additional insured)
- Electric Supply, Communication or Telephone Line: Coverage of at least $2,000,000 per occurrence and $6,000,000 in the aggregate (UP and RFTA named as additional insured)
- Temporary Occupancy: Coverage of at least $2,000,000 per occurrence and $6,000,000 in the aggregate.
- Public and Private Crossing: TBD- Please Arrange Meeting w/ RFTA Risk Management
- General License/ Drainage: Coverage of at least $2,000,000 per occurrence and $6,000,000 in the aggregate
- Structures/Fence/Encroachments (Long Term): Coverage of at least $2,000,000 per occurrence and $6,000,000 in the aggregate

(5) Pollution Legal Liability Insurance (if necessary)

- Pipeline, Overhead Pipe Truss or Conveyor System: In an amount of at least $5,000,000 per occurrence and $10,000,00 in the aggregate.
- Electric Supply, Communication or Telephone Line: None (Exception: Transformer or Switchgear on RFTA R/W, then In an amount of at least $5,000,000 per occurrence and $10,000,00 in the aggregate (PCB's et al)

- Temporary Occupancy: Only if on RFTA property w/ Hazmat Risk (see RFTA for specifics)
- Public and Private Crossing: TBD- Please Arrange Meeting w/ RFTA Risk Management (most likely none unless there is qualifying transport of hazmat known to exist)
- General License/ Drainage: Only if on RFTA property w/ Hazmat Risk (see RFTA for specifics)
- Structures/Fence/Encroachments (Long Term): Only if on RFTA property w/ Hazmat Risk (see RFTA for specifics)

Please Note: These limits are subject to change without notice. An Agreement will be provided to you, which contains details concerning insurance requirements. Miscellaneous requests such as house moves, temporary fire lines, vegetation control, construction occupancy etc. will be handled on a by case basis under RFTA's General License policy.

RFTA REQUIRES CERTIFIED PROOF OF INSURANCE – PLEASE ATTACH HERE

APPLICATION CROSS REFERENCE

If this application also involves City/County permitting, please enter applicable data here.

County: (Colorado)

Permitting Agency:

Permit/Application Number:

Type of Permit:

Description:

Attachments:

* If attaching a copy of digital file for future use by RFTA, please include the name/extension of the file and where it is located.

☐ Attached, please find copy of Land Use Form, Dated

Submitted to

☐ Colorado Depart of Transportation CDOT Department

☐ Count of

Department

☐ Bureau of Land Management

Other

* For Coordination Purposes Only

Description

Application # / File #

Approved:

RFTA FEE TABLE	RFTA Legal Review	RFTA Admin Cost- One-time Fee	RFTA Annual Fees	RFTA Engineer Review	RFTA Engin Srvy - GIS Entry	RFTA Site/Const. Inspection Verification	Insur. Req'd	Add'l Time & Matrl Chgs	Annual Fee	FORM G-8	DG&S Sections	Forms
Long Term/ Commercial Lease of Land	All direct costs associated with legal review- No markup	$ 100.00	$ 1,800.00	All direct costs associated with legal review- No markup	Included in Legal Review		Yes		Yes	Note 1,2	1,2,7,10 11	G-1,2,4, 5
Utility Crossing	All direct costs associated with legal review- No markup	$ 100.00	$17.00 Per Lineal Foot	All direct costs associated with legal review- No markup	Included in Legal Review	$100.00 Per day	Yes		Yes	1,2	1,2,3,11	G -1,2,4,5 A-2,3,6
Public Rd Crossing	All direct costs associated with legal review- No markup	$ 100.00	$10.00	All direct costs associated with legal review- No markup	Included in Legal Review		No	Yes	No	1,2,5	2,4,5,6,9	G-1,2,4,5,6 7 10
Private Rd Crossing	All direct costs associated with legal review- No markup	$ 100.00	$100.00	All direct costs associated with legal review- No markup	Included in Legal Review		No	Yes	Yes	1,2,5	1,2,5,9,11	G- 1,2,5,6, 10
Trail Crossing Encroach	All direct costs associated with legal review- No markup	$ 100.00	$9.00 Per Square Foot	All direct costs associated with legal review- No markup	Included in Legal Review		Cond	Yes	Yes	3,1,2,5	1,2,5,7,11	G- 1,2,5,6, 10

Drainage Crossing Encroach	All direct costs associated with legal review- No markup	$ 100.00	$9.00 Per Square Foot	All direct costs associated with legal review- No markup	Included in Legal Review	$100.00 Per day	Cond	Yes	Yes	3,1,2,5	1,2,5,7,8 11	G- 1,2,4,6 A 6
Fence or Structure Encroach	All direct costs associated with legal review- No markup	$ 100.00	$50.00	All direct costs associated with legal review- No markup	Included in Legal Review		Cond		Yes	3,1,2	1,2,5,7 10,11	G -1,2,4,6
Assign Existing Contract	All direct costs associated with legal review- No markup	$ 100.00	$100.00	All direct costs associated with legal review- No markup	Included in Legal Review		Cond		Yes	3,1,2	1,2,5,11	G- 1,2,4
Permit For Permission to Begin work in ROW	All direct costs associated with legal review- No markup	$50.00		All direct costs associated with legal review- No markup	-0-	$50.00 Per day	Yes		No		1,2,5,11	G -1,2,4
Signboard Lease	All direct costs associated with legal review- No markup	$ 100.00	$50.00	All direct costs associated with legal review- No markup	Included in Legal Review		Cond		Yes	3,1,2	1,2,5,9,11	G- 1,2,4,6
Temp Geotech Investig.	All direct costs associated with legal review- No markup	$ 100.00		All direct costs associated with legal review- No markup	-0-		Yes		No		1, 9	G- 1,2,4 A- 7 (A-5)
Environ. Investig. Entry	All direct costs associated with legal review- No markup	$ 100.00		All direct costs associated with legal	-0-		Yes		No		1,9	G- 1,2,4, A- 7

				review- No markup								
Temp Survey Entry	All direct costs associated with legal review- No markup	$ 100.00		All direct costs associated with legal review- No markup	-0-	-0- Note 4	No		No	4,1,2	1,11	G-1,2

APPLIES	DESCRIPTION	FEE		NOTE	PROCESS TIME
☐ A	General Application Fee	$100.00			7-10 Days
☐ B	Overhead Conveyor Structural Review	All direct costs associated with legal/operating review- No markup		A	30-45 Days
☐ C	High-Wide-Heavy Move	All direct costs associated with legal/operating review- No markup		Insurance Mandatory	15-30 Days
☐ D	Flagman/Inspector	$1,750.00/day		B	3-5 Days' Notice
☐ E	Track Inspection for Special Rail Move	All direct costs associated with legal/operating review- No markup		W/ Short Term Contract Req	7-10 Days
☐ F	Film/Television/Advertising	Legal review and by case basis		Insurance mandatory	15-30 Days
☐ G	House Mover	By case basis		C, D	15-30 Days
☐ H	Out of Scope Fee	$500.00 per incident		Any work completed by applicant that is not included in permit is seen as out of scope and a fine will be administered.	
☐ I	NON-COMPLIANCE FEE	$500.00 Annually		Any work completed that does not meet the original design will receive a yearly fine until brought into compliance by applicant.	
☐ J					

Note: In most cases, permit fees require RFTA to process the initial application fees, and comment/request corrections, plus a second review with corrections. Beyond the second review, time and materials charges may apply as determined by RFTA.

RFTA fees are independent of any City/County/State Permit fees.

A. Time & Materials Basis
B. Radio Equipped/rules qualified person under GCOR in freight rail easement. No exceptions if track is “in use” in Union Pacific’s and RFTA’s dispatching systems
C. All term “days” in the above are working days.
D. House moving contracts require CDOT/City/County Permits first
E. RFTA is now implementing a fine/fee charge for any work completed that is not approved or does not meet RFTA Standards once installed.

TABLE G-8

RFTA FEE MATRIX NOTES

Note 1 Fees are paid for monthly throughout application process ~~at initial application as an "Up Front Fee"~~ for time and materials fee as generated by RFTA and its designated consultant/sub-consultants. ~~Any funds remaining at the end of the application process will be refunded to the applicant~~.
RFTA will not begin the application review ~~until fees~~until a reimbursement letter has ~~have~~ been received. RFTA will not allow construction or use of license for purpose intended until all license fees, conditions and insurance requirements have been met.

Note 2 Because of the nature of time and materials work, RFTA will not set a specific review fee amount. The fees will be administered at an hourly rate. ~~Because of the nature of time and materials work, RFTA will notify applicant if initial application fee is at risk of being exceeded.~~

Note 3 "Cond" = Conditional determination for insurance requirements predicated on purpose and use per review by RFTA's Risk and Insurance Manager

Note 4 Insurance requirements and Flagman/Inspector rules change when Surveyors enter into Union Pacific's Freight Rail Easement, fouling any active track. (Including possible UPRR Flagman fees).

Note 5 Memorandum of agreement and additional fees may be required depending on scope and size of project conditions imposed by Colorado PUC may also be involved with public roads and/or utilities. All to be handled on a case-by case basis.

Note 6 Any utility location fees will be borne by the Applicant to satisfy RFTA/City/County/State requirements.

Conditional: Conditional Fee, may be waived by RFTA

GENERAL ROAD/TRAIL CROSSING APPLICATION

ROAD/TRAIL APPLICANT:

Please fill out and submit forms G-1, G-2, G-3 and G-4, joint with this form

Crossing of the RFTA corridor is what type?

- ☐ Proposed new public road crossing
  DOT# Location:
- ☐ Reconfigured Existing Public Crossing
  DOT# Location: DRGW MP:
- ☐ Trail/Pedestrian way connecting to RFTA's Rio Grande Trail
- ☐ Existing Private Crossing Assignment
  DOT# Location: DRGW MP:

Private Crossing/Driveway

- ☐ Residential Driveway (New)
- ☐ Commercial-Industrial (New)
- ☐ Fire Department Access (New)
- ☐ Temporary/Construction Use (New)
  Purpose:
- ☐ Other:

Type of Crossing: ☐ Grade Separated ☐ Over RR ☐ Under RR ☐ At Grade

Crossing serves a landlocked parcel of Real Estate? Yes ☐ No ☐

Crossing will allow retirement/closing/consolidation of other crossings? Yes ☐ No ☐

Assignment of Existing Crossing

Existing Crossing User:

DRGW/SP/RFTA Contract #
(Please attach copy)

Easement

☐ Recording Information: County

Deed

Book Page

REC# Date:

Grantor: Grantee:

(Please attach copy)

☐ Other

☐ Public Crossing

Has the Colorado Public Utilities Commission (CPUC) been Notified? ☐ Yes ☐ No

If Yes; Docket No.

Existing CPUC Application/Decision # Date.

(Attach Copy of Applicable

G-11 Form

Permit Application Form

Due Diligence checklist AND application for Public Improvement Permit

In order for RFTA to assist you in a timely and efficient manner please provide the following information:

Have the Site Plans been approved? Yes No N/A Site Plan #

_____

Is there a Geotech for this project? If so, list firm name, contact, address, phone, and email:

_____

_____

Is this a City, County or CDOT Project? Yes No If yes, have you received your notice to proceed?

Yes No (Permit cannot be obtained until notice to proceed has been approved.) Who is the Project Manager for this project?

_____

Traffic Control Plan (TCP). Any work in the right of way restricting access to ROW will require an approved traffic control plan prior to permit issuan

A detailed Schematic for the project.

A detailed Schedule for the project.

To obtain information on any of the above please contact 970.384.4971

Date Effective: _____ Start Date:_____

RFTA Contract: _____ Expiration Date:_____

RFTA Location: _____ RFTA MP: _____

Near / Address_____ DRGW MP: _____

UNCC DIG Ticket #:_____

FRAC-OUT PLAN: _____ SAFT/CBOD

Flagging Plan: _____

Barricade Plan: _____

City/County Plan: _____

GOCO Mitigation: _____

Emergency Action Plan: _____

***** REMEMBER THE AS-BUILT! *****

LICENSE AND INSURANCE REQUIREMENTS

Contractor shall carry a comprehensive general liability policy, including broad form property damage, completed operations and contractual liability for limits not less than $1,000,000.00 each occurrence for damages of bodily injury or death to one or more persons, and $2,000,000.00 each occurrence for damage to or destruction of property.

Approval for Permittee: In accepting this permit, the applicant has read and understands all of the general provisions, certifies that they have the authority to sign for and bind Permittee, and by virtue of their signature the Permittee is bound by the provisions of this permit, RFTA and all other Ordinances State laws regulating construction.

Print Name:

_____

Signature: _____ Date: _____

Email your plans and TCP's to: ahenderson@rfta.com, apascoe@rfta.com, bmeredith@rfta.com

All of the above must be verified prior to permit issuance. Call 970-384-4971 to speak directly with a team member if there are any questions.

☐ Insurance Complete ☐ Traffic Control Plan ☐ Detail Schedule Received ☐ Detailed Schematic
☐ License Application Received and Approved

RFTA PERMIT APPROVAL: Permit #_____

Approved By: _____ Date Approved: _____

Angela M. Henderson, Assistant Director,
Property Management & Facilities Operations

KEEP CONTRACT & THIS SHEET WHILE WORKING ON RFTA PROPERTY

RFTA Emergency # 1-833-456-0153

G-12 Form

CONTRACTOR RESTORATION OBLIGATIONS

_____(Contractor name), has reviewed and agrees to follow the restoration specifications as described in the Roaring Fork Transportation Authority Rio Grande Trail Restoration Seeding Plan, Cattle Creek Road to Catherine Store Bridge - January 2020, (Appendix 4 - Seeding, Soil Preparation and Erosion Control Specifications). This includes any and all ground disturbing activities requiring physical site restoration.

By signing this agreement, the contractor assumes all responsibility for completing restoration specifications, including monitoring for three years. Additionally, the contractor agrees to purchase and utilize the recommended seed mixes (1-4) described in the Recommendations Section, part A. Recommended Seed Mixes. Seeding substitutions will need to be reviewed on a case by case basis with the RFTA Trails and Corridor Manager.

Approval for Permittee: In accepting this permit, the applicant has read and understands all of the general provisions, certifies that they have the authority to sign for and bind Permittee, and by virtue of their signature the Permittee is bound by the provisions of this permit, RFTA and all other Ordinances State laws regulating construction.

Print Name: _____

Signature: _____ Date: _____

RFTA PERMIT APPROVAL: Permit #_____

Approved By: _____ Date Approved: _____

Brett Meredith, Trails and Corridor Manager

1.3 REFERENCES AND SOURCE MATERIAL:

References and source materials in this Design Guidelines and Standards document were compiled from commonly available material already in common use from:

- The Federal Railroad Administration (FRA/USDOT) - http://www.fra.dot.gov/Page/P0020
- The Transportation (Railroad) Section of the Colorado Public Utilities Commission (PUC):
  http://cdn.colorado.gov/cs/Satellite/DORA-PUC/CBON/DORA/1251632608629
  http://cdn.colorado.gov/cs/Satellite/DORA-PUC/CBON/DORA/1251614750747
  http://cdn.colorado.gov/cs/Satellite/DORA-PUC/CBON/DORA/1251631146828

- The American Association of State Highway & Transportation Officials (AASHTO):
  http://www.transportation.org/Pages/Default.aspx

- The American Railway Engineering and Maintenance of Way Association (AREMA):
  https://www.arema.org/arema_publications.aspx

- The Federal Highway Administration (FHWA/USDOT):
  http://www.fhwa.dot.gov/
  http://www.fhwa.dot.gov/research/library/

- Union Pacific Railroad (UP or UPRR)
  http://www.uprr.com/aboutup/operations/specs/track/index.shtml
  http://www.uprr.com/aboutup/operations/specs/attachments/grade_separation.pdf

- BNSF Railway (BNSF)
  http://www.bnsf.com/communities/faqs/permits-real-estate/
  http://www.bnsf.com/communities/faqs/pdf/utility.pdf

- Surface Transportation Board (STB/USDOT)
  http://www.stb.dot.gov/stb/index.html

- RFTA's Policies and Procedures (http://RFTA.com)

- National Electrical Code (NEC/NFPA):
  http://www.nfpa.org
  http://www.nfpa.org/codes-and-standards/free-access

- Pipeline & Hazardous Material Safety Administration (PHMSA/USDOT)
  49CFR100-185 (Hazardous Materials) and 49CFR190-199 (Pipeline Safety):
  http://www.phmsa.dot.gov/
  http://www.phmsa.dot.gov/pipeline/regs

2. Crossings

2.1 PUBLIC VS PRIVATE POLICY

RFTA's goal is to maintain the former rail corridor in a condition compatible with rail reactivation, the implementation of a future commuter rail system, and a safe and secure interim trail operation consistent with 16 U.S.C. 1247(d) and continued STB jurisdiction. To this end, RFTA seeks to avoid any obstructions to the corridor that might amount to an arguable "severance" precluding rail reactivation. This requires RFTA to be vigilant not only to avoid granting property interests that disrupt the continuity of the corridor, but also to avoid allowing changes in the elevation of the railbed, or the installation of aerial, surface, or subsurface structures that are incompatible with freight rail reactivation or commuter rail construction and operation. In order to ensure compliance with 16 U.S.C. 1247(d), RFTA views itself as obligated to ensure that the Corridor is kept intact, continuous, unencumbered by future financial burdens and unobstructed by significant structures that would impede or impair freight rail reactivation. This obligation is a kind of minimum condition that sponsors of all proposed uses (including crossings) of the Corridor must adequately address.

Consistent with general railroad policies, RFTA seeks to consolidate or to remove at-grade motor vehicular crossings whenever practicable. New motor vehicular crossings, especially at-grade crossings, should be minimized to the extent practicable. Ideally, such crossings should be grade separated to minimize risk of impairing future rail restoration. However, if a crossing is not grade separated, RFTA may require grade separation of the bicycle and pedestrian trail from the at-grade motor vehicular crossing with the costs of such separation to be negotiated by crossing sponsors and RFTA. Nothing in this document, paragraph, or section however, is intended to obligate RFTA to make any contributions or otherwise obligate RFTA to collaborate on such improvements if such improvements would be inconsistent with the ACP and these DG.

Any new crossing in the RFTA corridor must have an appropriate license or other documentation, as provided below.

Public crossings require a written license or other contract agreement with RFTA prior to construction, operation, or alternation. In addition, to the extent consistent with 16 U.S.C. 1247(d) and RFTA's right to operate a public trail on the premises, and to the extent CPUC has jurisdiction over railbanked railroad corridors, require review and approval by the CPUC, and a license, agreement, or easement from RFTA. To have the best prospect of obtaining RFTA's support for the crossing, prior to any submittal to the CPUC, crossings should be reviewed and approved by RFTA, and there should be an agreement in place with RFTA that addresses construction, maintenance, and other issues as designated by RFTA. As noted, any changes to those crossings (beyond in kind changes to the crossing surface) may require additional RFTA review and approval. Changes include changes in length/ changes in the number of tracks/ changes in lanes or angle of the crossing/changes in warning devices/changes in clearances. Failure to comply with the terms of the license or other Agreement with RFTA will constitute a breach of contract and risks closure of the crossing until the non-complying terms have been adequately addressed. RFTA prefers to permit crossings in the form of a license agreement or contract, but may grant an easement subject to terms that are mutually agreeable and approved by the RFTA Board. Utilities seeking to cross the RFTA rail trail right of way must likewise obtain a license, contract, or easement from RFTA, consistent with RFTA's ACP and these DG. In all events, all costs associated with constructing or maintaining the crossing must be borne by the manager/owner of the road or utility involved, unless

RFTA voluntarily agrees to bear a portion of the costs or a portion of the costs are allocated to RFTA by the CPUC. In addition, the relevant public or utility authority must enter into an agreement to hold RFTA harmless from any and all liability, including claims for personal injury or property damage, and including attorneys' fees relating to such claims, arising from construction or use of the crossing.

Private crossings require a prior written agreement in the form of a 30-day terminable license between a private individual or entity and RFTA consistent with RFTA's ACP. RFTA seeks to avoid new private at-grade motor vehicular crossings whenever other practicable alternatives are available

The holder of the private crossing license shall be solely responsible for construction and maintenance of the crossing, and shall maintain insurance (with 30 days' notice to RFTA prior to cancellation) in an amount satisfactory to RFTA naming RFTA as a third party insured as to any claim arising from construction, maintenance or use of the crossing.

In all events, all such crossings are solely the responsibility of the private individual or entity that obtained the crossing license. Private crossing licenses may not be sold, subdivided or otherwise assigned. All private crossing rights are personal to the individual private licensee and do not run with the land.

Private parties contemplating subdivision and redevelopment should note that RFTA is reluctant to create additional new private motor vehicular crossings of the RFTA corridor without, whenever practicable, consolidating or otherwise eliminating existing crossings elsewhere. RFTA has been advised that in some cases, local agencies require new subdivisions to maintain a second entry for emergency services access in the event the main entrance is blocked. RFTA will consider allowing a private crossing as an emergency services access provided all other alternatives have been exhausted and the entrance is strictly limited to emergency services access. Any such emergency services access private crossing shall require a license, and be otherwise consistent with the ACP and these DG.

For all private crossings licensed after the date of adoption of the ACP and DG, RFTA may require the private individual landowners and entities to provide liability insurance coverage acceptable to RFTA for their use of the Railroad Corridor and/or to indemnify and hold harmless RFTA from all claims arising from the use and existence of the crossings.

RFTA Agency Crossings are for RFTA's exclusive use only and do not include dual uses by other agencies.

To the extent practicable, it is RFTA's policy that all crossings should have an assigned FRA/DOT number and must be entered into the Federal Database (administered locally by CDOT). Any crossing without a valid DOT number is subject to closure and may be removed until a FRA/DOT number is assigned. DOT Numbers apply to all at-grade and grade separated crossings.

IN GENERAL:

(1) In order to ensure that RFTA complies fully with 16 U.S.C. 1247(d), and in order to ensure that RFTA's property is retained intact for freight and commuter rail, as well as open space purposes, RFTA intends, to the extent practicable, to treat the Rio Grande Trail Corridor as if it were an operating freight rail corridor. To the extent practicable, bridges (overpasses/ underpasses) constructed on the corridor will be designed and constructed in a manner that is consistent with this ACP and DG. To the extent practicable, any crossing of the RFTA corridor should be designed to meet current freight rail standards when constructed RFTA does not wish to assume any significant risk that an obstruction inconsistent with rail reactivation will render all

or a portion of the corridor ineligible for regulation under 16 U.S.C. 1247(d).

(2) Consistent with the above, design of an at grade crossing will meet or exceed grade and alignment specifications as noted in the AREMA / AASHTO Joint Specifications (AREMA Section 5.8.1.3 or AASHTO's Uniform Policy " A Policy on Geometric Design of Highways and Streets, 6th Edition" (https://bookstore.transportation.org/item_details.aspx?ID=1175) unless granted a variance by RFTA.

(3) In order to protect the integrity of the corridor, RFTA will treat any opening or gate in a right of way fence on the corridor as a crossing. Unless the crossing can be licensed, RFTA will treat it as undocumented. Undocumented crossings are prohibited. RFTA shall reserve the right to fence, lock or otherwise permanently obstruct the crossing, without liability to RFTA, and will require that all costs, including attorneys' fees, be borne by the user of the undocumented crossing. In general, RFTA shall require that the RFTA contract number for all non-motor vehicular crossings be posted at the crossing location.

(4) Any opening at a location other than a public/private/RFTA use crossing must have a sign at the opening showing the RFTA contract number and location covered by that contract (owner's name is optional)

(5) FRA VISION EASEMENT MODEL LAW: (to be implemented where possible)

http://www.oig.dot.gov/sites/dot/files/pdfdocs/Final_Signed_508_Grade_Crossing_Report_05_03-07.pdf, or http://www.fra.dot.gov/Elib/Document/2133

RFTA's policy on the addition of any new motor vehicle crossing of the rail trail will be to examine the approaches to any at-grade and grade separated crossings to ensure that motor vehicle users and trail users (and ultimately railroad operators) have sufficient vision distance to comply with any pertinent distance safety and collision avoidance parameters.
FHWA, FRA, AREMA, MUTCD, and ASHTO all have overlapping suggested standards or recommendations at grade crossing intersections to maximize vision distance safety. Parties holding crossing rights are advised that alterations to (or termination of) a crossing license (without cost or liability to RFTA) may be required in the event of rail reactivation or in the event pertinent standards change. However, RFTA acknowledges that access to private property that is adjacent to the Railroad Corridor must be accommodated by RFTA.

(6) EMERGENCY NOTIFICATION SIGN SYSTEM (ENS) Signage. For any portion of the RFTA right of way that is currently in actual rail use or is reactivated for rail use, effective June 1, 2017, all at-grade rail crossings must have an Emergency Notification Sign (ENS) sign in place that meets the federal standard established in Section 205 of the Rail Safety Improvement Act of 2008 and followed by statute 49CFR234.309. The ENS is a sign, posted at or near a crossing that lists a telephone number along with a US DOT number. The ENS is used to notify the railroad (RFTA) of an emergency or warning device malfunction.

§ 234.309 ENS signs in general:

(a) Provision of information. If the dispatching railroad and the maintaining railroad(s) are not the same entity, the dispatching railroad for a highway-rail or pathway grade crossing shall provide to the maintaining railroad the telephone number that is to be displayed on the ENS sign at the crossing, not later than 180 calendar days before the date that implementation of an ENS is required.

(b) Information to be displayed. Each ENS sign located at each highway-rail or pathway grade crossing as required by § 234.311 shall display the necessary information for the dispatching railroad to receive reports of unsafe conditions at the crossing. This information, at a minimum, includes the following:

(1) The toll-free telephone number (or non-toll-free telephone number as provided for in § 234.303(e)) established to receive reports pursuant to § 234.303(a);

(2) An explanation of the purpose of the sign (e.g., "Report emergency or problem to U.S. DOT National Crossing Inventory number assigned to that crossing.
(*) there may be dual signage in the RFTA corridor where RFTA and UP/Amtrak operating rights overlap in Glenwood Springs (wye and tail track area), MP 360.22 – MP 361.73

(c) Sign size and other physical features. Each ENS sign shall—

(1) Measure at least 12 inches wide by 9 inches high;
(2) Be retro-reflective;
(3) Have legible text (i.e., letters and numerals) with a minimum character height of 1 inch for the information required in paragraph (b) of this section; and
(4) Have white text set on a blue background with a white border, except that the U.S. DOT National Crossing Inventory number may be black text set on a white rectangular background.
(5)

(6) Identify the owner/operator of the rail line using its UMLER code identification [RFTA's UMLER CODE REMAINS "RFRX", a holdover from RFTA predecessor RFRHA]
(7) RFTA's Toll-Free Emergency Number is **1-833-456-0153** ~~(pending)~~

(7) DOT Numbers ..... [Federal-Aid Highway Act of 1973 (Section 203)]
In the event of rail reactivation, DOT Numbers will be assigned to all crossings. DOT Numbers are a system established by the federal government in 1970, currently maintained by the Intermodal Section of CDOT, to uniquely track each public, private and company (RFTA) special use crossing in the country. All highway, pedestrian, trail, bicycle crossings in the corridor must

have a DOT Number assigned and displayed. (Last FRA Update 10-27-2011, 2014 update is pending)

The US DOT Crossing Inventory Number contains six digits followed by an alpha check character (example: 123 456X). The alpha character is a check to ensure that the number is valid and provides a unique identifying number which was designed to prevent the possibility of error by ensuring that the crossing information is recorded for the correct location. FRA uses a special Algorithm to generate the valid crossing number for assignment. (See the "Highway-Rail Crossing Inventory Instructions and Procedures Manual," December 1996, for details.) The number is like a "street-name sign" and is to be posted, preferably, on both sides of the crossing on a signal mast, crossbuck post, sign post, or pole, or stenciled on a bungalow. Responsibility for procuring or making the number board signs is that of the railroad. The signs are usually made of aluminum, about motorcycle license plate size (4" x 9") with 1½ inch size numbers/letters. Sample Inventory Number Sign Posted at Highway-rail Crossings:

Specifications: Light-gauge (.032") aluminum, 4" x 9" size, embossed with 1½" numeric-alpha characters, with 4 side slots on each side for mounting. Railroad Initials and U.S. DOT Inventory Number embossed with ½" characters.

The responsibility for assigning the crossing number and for filing the inventory report is that of the "Operating Railroad," that is, the railroad entity that actually operates a train. (Since 1988, the maintenance of the record has been assumed by CDOT's Intermodal Section instead of the railroad/ track owner.) (FRA)

2.2 WIRELINE CROSSING/NEC CODE

(1) No wireline crossing over RFTA's rail corridor will be installed without RFTA's knowledge and consent. A license agreement shall be obtained, along with permission to cross the railroad right- of way from RFTA.

(2) All overhead wireline crossings must comply with the National Electrical Code, currently as stated in Articles 225.60, 230.24 230.26 and NESC Rules 230- 232 (complete)

(3) No circuits for lighting and power shall be connected to any system that contains trolley wires, catenary wires with a ground return. (2014 NEC Handbook, Article 110.19)

(4) Witness posts of durable construction at the right-of-way lines for underground lines and signs on poles nearest the right-of-way line shall carry the name of the utility owner, that utility's emergency number and the RFTA contract number/location.

(5) Depending on the anticipated voltage, lines shall cross the rail corridor as follows:

OVERHEAD WIRELINES AND CABLES

Overhead, Lines and Cables 750 volts or less:

1.) The latest published edition of the National Electrical Safety Code shall apply with the height of rail car assumed to be 24 feet. If the local governing body does not recognize the latest published edition of the NESC, RFTA will have to review each item on a case by case basis.

2.) Minimum 4 feet clearance required above signal and communication lines.

3.) Poles must be located 50 feet out from the centerline of railroad main, branch and running tracks, CTC sidings, and heavy tonnage spurs. Pole location adjacent to industry tracks must provide at least a 15-foot clearance from centerline of track when measured at right angles. If located adjacent to curved track, then said clearance must be increased at the rate of 1.5 inches per degree of curved track.

4.) Regardless of the voltage, unguyed poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the groundline plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning/falling in the direction of the tracks.

5.) Poles (including steel poles) must be located a minimum distance from the railroad signal and communication line equal to the height of the pole above the groundline or else be guyed at right angles to the lines.

6.) All crossings must be located a minimum of 500 feet from the end of any railroad bridge, and 300 feet from the centerline of any culvert or switch area.

Overhead, Lines and Cables Carrying More Than 750 Volts:

1.) The latest published edition of the National Electrical Safety Code shall apply with the height of rail car assumed to be 24 feet. If the local governing body does not recognize the latest published edition of the NESC, RFTA will have to review each item on a case by case basis.

2.) Poles or other structures supporting power must be 50 feet out from the centerline of main running tracks, CTC sidings, lines under catenary and heavy tonnage spurs. Pole location adjacent to industry tracks must provide at least a 30-foot clearance from centerline of track when measured at right angles. If located adjacent to curved track, then said clearance must be increased at the rate of 1.5 inches per degree of curved track.

3.) Regardless of the voltage, unguyed poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the groundline plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning/falling in the direction of the tracks.

4.) High voltage poles and structures (34.5kV and higher) must be located off railroad right of way. 5.)

Crossings will not be installed under or within 500 feet from the end of any railroad bridge, or 300 feet from the centerline of any culvert or switch area.

UNDERGROUND WIRELINES, CONDUITS AND CABLES

Underground Wireline Cables, Conduits & Wire 750 Volts or less:

1.) A minimum depth of 4.5 feet below the base of rail (B/R) will be maintained except that a minimum of 5 feet BBR will be maintained for fiber optic cable wirelines.

2.) A minimum of 3.0 feet below natural grade (BNG) will be maintained except that a minimum of 5 feet below natural grade (BNG) will be maintained for fiber optic cable wirelines.

3.) Casing must extend a minimum of 30 feet out from the centerline of the nearest track, when measured at right angles. The casing material shall be steel or rigid metal conduit (no PVC) for typical burial depths. PVC will be considered acceptable if the burial depth is at least 15 feet.

4.) Horizontal directional drilling is not an approved method of installation unless the burial depth is at least 15 feet, the conduit/casing size is six inches or less, and the Interim Guidelines for Horizontal Directional Drilling under RFTA (RFTA/Union Pacific Railroad Right of Way) are followed. The interim guidelines are as stated in Section 2.3

5.) Crossings shall not be installed under or within 50 feet from the end of any railroad bridge, centerline of any culvert or switch area.

6.) A (RFTA/UP, jurisdiction dependent) Railroad signal representative must be present during installation if railroad signals are in the vicinity of wireline crossing unless signal representative authorizes otherwise.

Underground Wireline Cables, Conduits & Wire Carrying More Than 750 Volts:

1.) A minimum depth of 4.5 feet below the base of rail (B/R) to the top of the facility will be maintained.

2.) A minimum of 4.0 feet below natural grade (BNG) to the top of the facility will be maintained. 3.)

The wireline must be encased completely across the railroad right of way with a rigid metallic conduit or non-metallic conduit (PVC) encased in a minimum of 3 inches of concrete.

4.) A 6-inch wide warning tape will be installed 1-foot BNG directly over the underground power line where located on railroad right of way outside the track ballast sections. No warning tape is required above directional boring routes.

5.) Crossings shall not be installed under or within 50 feet from the end of any railroad bridge, centerline of any culvert or switch area.

6.) A (RFTA) Railroad signal representative must be present during installation if railroad signals are in the vicinity of wireline crossing unless signal representative authorizes otherwise.

SPECIAL NOTE:

(1) In all wireline cases, the emergency cut-off locations, switches, breaker box locations where lines crossings can be rendered inert/ de-energized must be provided/submitted to RFTA at time of permit submittal for inclusion in RFTA's GIS Emergency Management System. Changes

and modifications afterwards to these locations after installation should be provided to RFTA.

(2) The area below top of subgrade and 4.5 feet below base of rail, 3.0 ft below top of subgrade is the strata reserved for railroad signaling cables as dictated under 49CFR233-236.

(3) The National Electrical Safety Code and National Electrical Codes no longer always include the railroad safety design standards as a matter of course in their handbooks. Please be advised that American Railway Engineering & Maintenance of Way Association anticipates adding the NEC standard applied to railroads in its Chapter 28 (Clearances), anticipated to begin circa 2017. http://www.nfpa.org (Look for NFPA 70: National Electrical Code (NEC) Handbook, 2014 Edition)

(4) For further information on the National Electrical Safety Code, please contact:

NFPA
1 Batterymarch Park
Quincy, MA 02169-7471

www.NFPA.org
Telephone: +1 617 770-3000 Fax: +1 617 770-0700

What is the NESC vertical clearance above a railroad?

NESC Rule 232 covers the "vertical clearances of wires, conductors, cables, and equipment above ground, roadway, rail, or water surfaces." The required clearances above a railroad are shown below.

Item	Cable or Conductor	NESC Clearance	Comments
A	Phase	26.5 ft	Applies to phase wires 22kV and below. For voltages above 22kV phase-to-ground, see NESC Rules 232C and 232D.
B	Neutral	23.5 ft	Applies to neutrals meeting NESC Rule 230E1.
C	Secondary	24.0 ft	Applies to secondaries 750V or less meeting NESC Rule 230C2 or 230C3 (triplex, quadruplex, etc.).
D	Communication	23.5 ft	Applies to cable TV, phone, fiber optic cables, etc.

3. RFTA Utilities Accommodation Policy

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PART 1 - GENERAL POLICY

A. Policy Application

1. Purpose

This policy prescribes the accommodation, location, and method of installation, adjustments, removal, relocation, and maintenance of utility facilities within RFTA's property. The policy is adopted to ensure that railroad standards are met in connection with RFTA's property in respect to underground utilities.

2. Application

The policy concerning utility accommodations shall apply to all:

a. New utility installations.
b. Additions to existing utility installations.
c. Adjustment and relocation of utilities.
d. Existing or planned utility installations for which agreements with RFTA were entered prior to the date of the adoption of this policy.
e. Existing utility installations that do not meet the license requirements may remain at the discretion of RFTA.

Various types of utility lines not specifically discussed herein shall be considered within the provisions of this policy. It shall be the general practice to consider all lines carrying caustic, flammable or explosive materials under the provisions for high-pressure gas and liquid fuel lines.

3. Scope

Utilities include lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, stormwater and other similar commodities which are privately, publicly or cooperatively owned and which serve directly or indirectly the public or any part thereof.

A Utility License Agreement allowing a Utility Owner the privilege of placing its facilities in or on railroad property does not constitute a permanent right for such usage. Any removal, remodeling, maintenance or relocation of the facilities, whether or not required by RFTA, will be accomplished promptly by the Utility Owner at no cost to RFTA.

4. Exceptions

Exceptions to any design, location or methods of installation provisions contained in this policy must be authorized by RFTA. Requests for exceptions will be considered only where it is shown that extreme hardship and/or unusual conditions provide justification and where alternate measures can be prescribed in keeping with the intent of this policy. All requests for exceptions shall be fully documented including design data, cost comparisons, and other pertinent information.

5. Liability

The Utility Owner, its successors, or assigns shall assume all risk and liability for accidents and damages that may occur to persons or property on account of this work, and shall defend, indemnify and hold RFTA harmless from any and all costs, liabilities, expenses, suits, judgments or damages to persons or property or claims of any nature whatsoever arising out of or in connection

with the permit, or the operation and performance thereunder by the utility, its agents, employees or subcontractors. In this regard, it is further understood and agreed that the utility may be required to obtain insurance coverage as determined by RFTA.

The Utility Owner agrees that if liability insurance is required, it will file with the designated office, prior to granting of the license, "Certificates of Insurance" or other evidence to show that the appropriate insurance is carried and list RFTA as the additional insured on the certificate

Insurance, as may be required, shall be maintained in force until the final release of the Utility Owner by RFTA from all obligations under the terms of the license. The insurance contract shall cover claims for such length of time as law permits said claims. The insurance document shall include a clause requiring the insurer to notify RFTA ten (10) days in advance of any cancellation or change in insurance contracts.

The Utility Owner is responsible for any subcontractor to be knowledgeable of the policy and to require all work to be in compliance with this policy. Subcontractors must carry a liability insurance policy unless the subcontractor is covered by the Utility Owner's insurance.

6. **Replacement of Facility**
   Replacement of existing facility with the same facilities or facilities of a different type, or design, is to be considered as a new utility installation and all work shall adhere to this policy.

7. **Change in Ownership**
   It is the Utility Owner's responsibility to inform RFTA, in writing, of any name, ownership or address changes.

8. **Noncompliance**
   Noncompliance with any terms of this Utility Accommodation Policy or Utility License Agreements may be considered as cause for discontinuance of construction or operations until compliance is assured. Continued noncompliance will result in the revocation of the license. The cost of any work required by RFTA in the removal of non-complying construction will be assessed against the Utility Owner.

9. **Discharge of Waste Material**
   Applications for a Utility License Agreement for the installation of utility facilities which will discharge materials into the nation's waters must comply with all applicable requirements of Corps of Engineers, and other federal, state or local environmental protection agencies. Identification of applicable requirements and administration of compliance procedures are the responsibility of the Utility Owner.

B. Utility License Agreement Requirements

1. **General**
   Utility License Agreements are required when utility facilities are installed, relocated, removed or maintained along or across all RFTA property.

   If liability insurance is required, the evidence of adequate liability insurance is to be on file with RFTA for each agreement.

2. **Applications**
   Approved requests to install, maintain, relocate or remove a utility within the property of RFTA shall be authorized by a Utility License Agreement. The applications for utility license agreements along with plans for the proposed installation shall be submitted to RFTA and approved before construction has commenced (see blank forms in the appendix).

3. **Location**
   a. Utility lines shall be located to avoid or minimize the need for adjustments for future railroad improvements and to permit access to the utility lines for their maintenance with minimum interference to railroad traffic.
   b. The Utility Owner will not be permitted to attach to RFTA bridges or route facilities through drainage structures or cattle passes. Utilities are not to be attached to other railroad structures without the written approval of RFTA.
   c. Pipelines shall be installed under tracks by boring, jacking, or in some cases, open-trenching.
      WATER JETTING IS NOT PERMITTED.
      HYDRAULIC DIRECTIONAL DRILLING USING WATER ONLY OR UNAPPROVED (BY RFTA OR A QUALIFIED GEOTECHNICAL ENGINEER) DRILLING FLUID IS NOT PERMITTED.

      Where practical, pipelines carrying liquefied petroleum gas shall cross the railway where the tracks are carried on an embankment.

   d. All high-pressure pipelines (greater than 60-psi internal pressure), except those in public roads, shall be prominently marked at the property line (on both sides of the track for under crossings) by signs which state the size of the line and its depth.

   Example:

   CAUTION: 30-inch diameter high-pressure Gas main 7 feet deep. (Additionally, the Utility Owner, Contract Number, and Emergency Notification Telephone Number will be shown).

4. **Design Considerations**
   a. The design of any utility installation will be the responsibility of the Utility Owner. An installation within RFTA's property must be reviewed and approved by RFTA with regard to location and the manner of adjustment. This includes the measures to be taken to preserve the safety and flow of rail traffic, structural integrity of the roadway or structure, ease of maintenance and the integrity of the utility facility. Utility installations, on, over or under RFTA property shall conform with requirements contained herein and/or as a minimum, the appropriate requirements outlined in the following:
      1) Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines-National Electric Safety Code.
      2) Title 49 C.F.R. Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards and Amendments.
      3) Title 49 C.F.R. Part 195, Transportation of Liquids by Pipelines and Amendments.
      4) American Society for Testing and Materials (ASTM) Specifications - latest edition.
      5) Manual on Uniform Traffic Control Devices - with revisions.
      6) Rules and Regulations for Public Water Systems - latest edition, published by the appropriate State Health Department.

b. All utility installations on, over or under RFTA property shall be of durable materials designed for long service life and relatively free from routine servicing and maintenance.

   Conformance with current applicable material specifications and codes is mandatory.

c. References given to any manual, publication or specification are intended to be the most current edition. If a conflict occurs between any publication and this manual, the most restrictive specification will be used.

d. For all boring and jacking installations under main and passing tracks, greater than 26 inches in diameter, and at a depth of between 5.5 and 10.0 feet below top of tie, a geotechnical study will need to be performed to determine the presence of granular material and/or high-water table elevation, at the sole expense of the Permittee. The study will include recommendations and a plan for a procedure to prevent failure and a collapse of the bore. Generally, core samples are to be taken near the ends of the tie at the proposed location, at least as deep as the bottom of the proposed horizontal bore. Test results must be reviewed and approved by RFTA, or its agent, prior to boring activities commencing. RFTA reserves the rights, based on test results, to require the Permittee to select an alternate location or to require additional engineering specifications be implemented, at the sole expense of the Permittee, in order to utilize existing location.

C. Safety

1. General

A safety orientation course will be completed by all workers prior to entering RFTA property. It is the contractor's responsibility to conduct the safety training and implementation of a safety program for its employees. Training materials are available on the website: www.contractororientation.com. The contractor must comply with all federal, state and local safety regulations.

2. Flagging

When work is performed within twenty-five (25) feet of the centerline of the track, railroad flagging will be required.

a. Railroad flagging will be required:
   1) During the period of construction when it is necessary for the Contractor to operate equipment in the vicinity of, or over, RFTA property which may endanger railroad operations, or
   2) Two or more railroad flagmen may be required at other times that RFTA's sole discretion shall deem necessary.

b. Flagging services shall be performed by RFTA employees or their consultants, and the total cost borne by the Utility Owner.

c. The Utility Owner will be billed monthly at a rate to be determined by RFTA to include labor and payroll associated costs plus any expenses incurred by RFTA for flagging services.

d. A written request for flagging services will be required at least 72 hours prior to the time when such services are needed. This request is made to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management &

Facilities Operations or his/her designee, as noted in agreement.

3. Material Storage

Storage of materials, parking of equipment and vehicles when not used in actual utility work will not be permitted on railroad property.

4. Call Before You Dig!

Call Underground Utility Notification Center (UNCC, aka "Colorado 811") at 1- 800-922-1987 (http://newtina.uncc.org/newtinweb/uncc_ticketexpress.html) or before any excavation or ground clearing activity on RFTA property. If your project is in Glenwood Springs North of 19th Street, you will have to additionally notify Union Pacific at 1-800-336-9193. Remember to copy down the Dig Ticket Numbers issued to you by UNCC and UPRR (where appropriate) Compliance with State Law at CRS 9-1.5-101 thru CRS 9-1.5-102 is mandatory. UNCC locators cannot locate on active railroad property. In any case, please provide RFTA with your projects Dig Ticket Numbers and have them with you while working on RFTA property. Failure to have proper RFTA documentation and Dig Ticket numbers will result in stoppage of all construction work on RFTA property (*and possible forced eviction*).

D. Maintenance and Servicing Utilities

1. Utility Owner's Responsibility

a. Maintenance of the utility is the responsibility of the Utility Owner.
b. The Utility Owner is responsible for informing RFTA of any maintenance work that is needed and obtaining a permit prior to any work beginning.
c. Maintenance must be performed to keep the facility in an as-constructed condition, and in a good state of repair in accordance with the requirements of Federal, State and Local laws, regulatory standards and utility codes.
d. It is the Utility Owner's responsibility to replace and stabilize all earth cover and vegetation when it has eroded over an underground utility facility where such erosion is due to or caused by, the placement or existence of the underground utility facility.
e. The Utility Owner shall be responsible for any settlement of backfill, fills, and embankments that may occur.

2. Emergency Maintenance

a. Emergency maintenance of utilities located on railroad property is permissible without obtaining a Utility License Agreement if an emergency exists that is dangerous to the life, safety or welfare of the public and which requires immediate repair. The Utility Owner shall take all necessary and reasonable safety measures to protect the public and RFTA.
b. The Utility Owner, in such an event, will advise the RFTA Assistant Director, Project Management & Facilities Operations or his/her designee as soon as possible. Damage to the right-of-way and facilities will be restored to its original condition. A Utility License Agreement should be requested by the Utility Owner within the second working day provided the work is not covered under any previously granted license. Flagging requirements described earlier apply in all situations.

E. Preservation, Restoration, and Cleanup

1. Disturbed Areas

a. Areas of railroad property, disturbed by the installation, maintenance, removal, and relocation of utilities shall be kept to a minimum.
b. Disturbed areas shall be returned to normal grade and elevation, with compaction of backfill material, and all excess or undesirable material removed by the Utility Owner. The Utility Owner shall replace destroyed vegetation by sodding, or seeding, fertilizing and mulching, or a combination thereof, to the standards set forth in any License Agreement or in accordance with GOCO Covenant Requirements.
c. The Utility Owner shall provide protection against erosion in disturbed areas that are subject to erosion. Such protection may be in the form of rock riprap, wash checks, hay or straw cover, or other material that is approved and does not interfere with railroad maintenance, in compliance with the standards set forth in any License Agreement or in accordance with GOCO Covenant Requirements.

2. Drainage Facilities

Care shall be taken to avoid disturbing existing drainage facilities. Underground utility facilities shall be bedded with pervious material and outlets provided for entrapped water. Underdrains should be provided where necessary.

3. Cleanup

Unused material or debris shall be removed from the work site area. At the end of every construction day, construction equipment and materials shall be removed as far from the operating railroad tracks as possible (minimum 25 feet from centerline). All machines will be disabled when not in use to prevent unauthorized operation.

F. Protection of Vegetation

Note – Any work performed within the Conservation Areas listed in the ACP shall strictly comply with the GOCO Covenant restrictions in those areas and also RFTA's Integrated Weed Management Policies. The following standards apply to the entire corridor, and in the conservation areas, the more restrictive requirements shall apply.

1. Trimming, Clearing or Removal of Vegetation

a. Consistent with the preservation of planted vegetation, consideration will be given to Utility Owners for the necessary trimming, clearing or removal of vegetation to provide adequate clearance of overhead wires. Such work will be done in accordance with established practices and standards; however, approval will not be granted for wasteful or wanton trimming or removal in order to provide easy solutions to a difficult situation.
b. No trees, shrubs, bushes, vines or ground cover on railroad property shall be sprayed, trimmed, cut down, rooted up, removed or mutilated in any manner unless a permit is granted by RFTA to do such work.

2. Chemical Brush Control

a. Spraying brush and seedling tree growth to prevent re-sprouting may be permitted, and when permitted, shall be carried out with extreme caution and careful performance. The Utility Owner shall be responsible for the performance of their employees or contractors in the application of brush control and approved by RFTA Environmental

Department.

b. All spraying shall be done by an herbicide applicator that is licensed in the state where the work is to be performed.
c. Permit applications for spraying shall list the kinds of chemical weed and brush killers that will be used. When liability insurance is required, it shall be provided by the herbicide applicator, or be insured under the liability insurance of the Utility Owner.
d. Plants over five (5) feet in height should not be sprayed for control. Brush over five (5) feet in height, which is to be removed, should be cut and the stumps treated to prevent growth. Shrubbery type growth such as dogwood, sumac, redbud, plum, etc., should not be sprayed as a general rule. Steep slopes, where brushy growth is a major factor in preventing erosion, should not be sprayed.

3. Tree Pruning

a. Tree pruning on railroad property for utility lines will utilize the best horticultural practices. All cut branches, dead limbs, etc., shall be removed. Such materials shall not be burned or disposed of on railroad property unless permission is granted by Utility License Agreement.
b. Burning is not allowed on RFTA's right of way. Should ditch burning be permitted, the Utility Owner will be held liable for any damage to grass, crops, native shrubs and trees arising from the careless burning of such brush.
c. Any and all limbs trimmed shall be removed with a clean cut and all limb scars over one (1) inch in diameter shall be treated with appropriate tree paint.

PART 2 UTILITIES PARALLELING RAILROAD PROPERTY

A. General Provision

This section of the policy applies to all public and private utilities, including electric power, telephone (including fiber optics), telegraph, cable television, water, gas, oil, petroleum products, steam, chemicals, sewage, drainage, irrigation and similar lines that are located, adjusted or relocated within the property under the jurisdiction of RFTA. Such utilities may involve underground, surface or overhead facilities.

Any utility line greater than five hundred (500) feet in length will be considered a parallel line and is to be located on uniform alignment, within ten (10) feet or less of the property line so as to provide a safe environment and to preserve space for future railroad improvements or other utility installations. RFTA must approve any installation over one mile.

Utilities will be located so as to provide a safe environment and shall conform to the current "National Electrical Safety Code," "American Waterworks Association Specifications," Federal Pipeline Safety Regulations," and "The American Railway Engineering and Maintenance Association Specifications." Where laws or orders of public authority prescribe a higher degree of protection, then the higher degree of protection prescribed shall supersede the provisions of this manual.

B. Overhead Installations

a. Minimum four feet clearance required above signal and communication lines.

b. Poles must be located 50 feet out from the centerline of railroad main, branch and running tracks, CTC sidings, and heavy tonnage spurs. Pole location adjacent to industry tracks; must provide at least a 10-foot clearance from the centerline of the track, when measured

at right angles. If located adjacent to the curved track, then said clearance must be increased at a rate of 1-½ inches per degree of curved t r a c k .

c. Regardless of the voltage, unguyed poles shall be located a minimum distance from the centerline of any track, equal to the height of the pole above the ground-line plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning/falling in the direction of the tracks.

d. Poles (including steel poles) must be located a minimum distance from the railroad signal and communication line equal to the height of the pole above the ground-line or else be guyed at right angles to the lines. High voltage towers (34.5 kV and higher) must be located off railroad right of way.

e. For proposed electrical lines paralleling tracks, RFTA may request that an inductive coordination study is performed at the expense of the utility owner. Inductive interference from certain lines has the potential to disrupt the signal system in the track causing failures in the track signals and highway grade crossing warning devices. Generally, if the proposed electrical line exceeds 12.5 kV *and* runs parallel to the track for at least 1,000 feet, a study will be required. A study will be required if a new sub-station is to be located within 1,000 feet of the track. The General Director of Signals will determine the need for a study on a case-by-case basis.

C. Underground Installations

1. Underground utility installations should be located on top of the back slope at the outer limits of RFTA's property.

2. If the pipeline is located forty (40) feet or less from the centerline of the track, the pipeline shall be encased in a steel pipe subject to approval from RFTA. No pipe may be placed closer than twenty-five (25) feet from the centerline of the track. The pipe must be buried with a minimum cover of three (3) feet.

a. If less than minimum depth is necessary because of existing utilities, water table, ordinance or similar reasons, the line shall be rerouted.
b. Locations, where it will be difficult to attain minimum depth due to wet or rocky terrain, shall be avoided. Any location change from plan must be approved by RFTA.

3. The use of a plastic carrier pipe for sewer, water, natural gas, and other liquids is acceptable under specific circumstances. The use of plastic pipe is satisfactory if the pipe is designed to meet AREMA and all applicable federal and state codes, and if the carrier pipe is properly encased with a steel casing pipe for the entire length on RFTA right of way.

4. Manholes shall be limited to those necessary for installation and maintenance of underground lines. Manholes vary as to size and shape depending on the type of utility they serve. To conserve space, their dimensions should be minimally acceptable by good engineering and safety standards. In general, the only equipment to be installed in manholes located on railroad property is that which is essential to the normal flow of the utility, such as circuit reclosers, cable splices, relays, valves, and regulators. Other equipment should be located outside the limits of RFTA's property. Manholes shall not protrude above the surrounding ground nor be located in the shoulder, shoulder slope, ditch, backslope, or within twenty-five

(25) feet of the centerline of the track without the approval of RFTA.

5. Electric Power Lines

a. A minimum depth of 3.0 feet below natural grade (BNG) will be maintained for 750 volts and less, and 4.0 feet BNG for greater than 750 volts.
b. A 6-inch wide warning tape will be installed, 1.0-foot BNG directly over the underground power line where located on Railroad right-of-way outside the track ballast sections.

6. Fiber Optic Lines

a. A minimum depth of 4.0 feet BNG for fiber optic cable wirelines.
b. Whenever feasible, all cable should be laid within 5 feet from property lines.
c. A 6-inch wide warning tape will be installed, 1.0-foot BNG directly over the underground fiber optic line where located on Railroad right-of-way outside the track ballast sections.

7. Abandonment/Removal of Facilities

a. Upon termination of license, the pipeline needs to be removed from RFTA property except for the portion under the track embankment.

C. Attachment to Bridges and Other Structures

The Utility Owner will not be permitted to attach to RFTA bridges or route facilities through drainage structures or cattle passes. Utilities are not to be attached to other railroad structures without the written approval of RFTA. As a general rule, overhead power, communication, and cable television line crossings at bridges must be avoided. Pipelines laid longitudinally on railroad property shall be located as far as practical from any tracks or other important structures. If located within forty (40) feet of the centerline of any track, the carrier pipe shall be encased or be of a material as approved by RFTA Engineering.

D. Drains for Steep Slopes (Tight Lines)

Drainage onto RFTA property from adjacent land that is significantly higher than the track elevation should be directed through a pipe anchored into the steep slope. The pipe needs to be designed to withstand the weight of the water in the pipe. The drainage system will include a diffuser at the bottom to prevent erosion on RFTA property (see appendix page A- 10 for an example).

In some instances, a concrete vault with a strike plate and bolted manhole cover may be required. The volume and velocity of discharge will determine the type of pipe or structure to convey the water across RFTA property. RFTA Engineering will review and approve the plan prior to execution of the license agreement.

PART 3 - UTILITIES CROSSING RAILROAD PROPERTY

A. General Provisions

This section of the policy applies to all public and private utilities, including electric power, telephone (including fiber optics), telegraph, cable television, water, gas, oil, petroleum products, steam, chemicals, sewage, drainage, irrigation and similar lines that are located, adjusted or

relocated within the property under the jurisdiction of RFTA. Such utilities may involve underground, surface or overhead facilities.

Installations crossing the property of the railroad, to the extent feasible and practical, are to be perpendicular to the railroad alignment and preferably at not less than forty-five (45) degrees to the centerline of the track. Utilities shall not be placed within culverts or under railroad bridges, buildings or other important structures.

Utilities will be located so as to provide a safe environment and shall conform to the current "National Electrical Safety Code," "American Waterworks Association Specifications," Federal Pipeline Safety Regulations," and "The American Railway Engineering and Maintenance Association Specifications." Where laws or orders of public authority prescribe a higher degree of protection, then the higher degree of protection prescribed shall supersede the provisions of this manual.

B. Overhead Installations

1. Minimum four feet clearance required above signal and communication lines.
2. Poles must be located 50 feet out from the centerline of railroad main, branch and running tracks, CTC sidings, and heavy tonnage spurs. Pole location adjacent to industry tracks; must provide at least a 10-foot clearance from the centerline of the track, when measured at right angles. If located adjacent to the curved track, then said clearance must be increased at a rate of 1-½ inches per degree of curved t r a c k .
3. Regardless of the voltage, unguyed poles shall be located a minimum distance from the centerline of any track, equal to the height of the pole above the ground-line plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning/falling in the direction of the tracks.
4. Poles (including steel poles) located a minimum distance from the railroad signal and communication line equal to the height of the pole above the ground-line or else be guyed at right angles to the lines. High voltage towers (34.5 kV and higher) must be located off railroad right of way.
5. Crossings must not be installed under or within 500 feet of the end of any railroad bridge, or 300 feet from the centerline of any culvert or switch area.
6. Complete spanning of the property is encouraged with support structures and appurtenances located outside railroad property. For electric supply lines, normally the crossing span shall not exceed 150 feet with the adjacent span not exceeding 1-1/2 times the crossing span length. For communication lines, the crossing span shall not exceed 100 feet in heavy loading districts, 125 feet in medium loading districts, and 150 feet in light loading districts; and the adjacent span shall not exceed 1-1/2 times the crossing span length. For heavier type construction, longer spans will be considered.
7. Joint-use construction is encouraged at locations where more than one utility or type of facility is involved. However, electricity and petroleum, natural gas or flammable materials shall not be combined. Pipe truss design and layout will need to be reviewed and approved by RFTA.
8. To ensure that overhead wire crossings are clear from contact with any equipment passing under such wires, communication lines shall be constructed with a minimum clearance above top of rail of twenty-four (24) feet, and electric lines with a minimum clearance of twenty-six and one-half (26 1/2) feet or greater above top of rail when required by the "National Electric Safety Code" or state and local regulations. Electric lines must have a fluorescent ball marker on the low wire over the centerline of the track.
9. The utility owner will label the posts closest to the crossing with the owner's name and telephone number for emergency contact.
10. All overhead flammable and hazardous material lines will need RFTA approval but should be

avoided if possible.

11. For proposed electrical lines crossing tracks, RFTA may request that an inductive coordination study is performed at the expense of the utility owner. Inductive interference from certain lines has the potential to disrupt the signal system in the track causing failures in the track signals and highway grade crossing warning devices. RFTA will determine the need for a study on a case-by-case basis.

C. Underground Installations

1. General

a. All underground utility crossings of railroad trackage shall be designed to carry Cooper's E-80 Railroad live loading with diesel impact (AREMA Cooper's loading Section 8-2-8). This 80,000- lb. axle load may be distributed laterally a distance of three (3) feet, plus a distance equal to the depth from structure grade line to the base of the rail, on each side of the centerline of single tracks, or centerline of outer track where multiple tracks are to be crossed. In no case shall railroad loading design extend less than ten (10) feet laterally from the centerline of the track. Longitudinally, the load may be distributed between the five-foot axle spacing of the Cooper configuration. Railroad loading criteria will also apply where future tracks on RFTA are contemplated, extent this information is available.

b. All utility crossings under ditches and railroad trackage should have a minimum depth of cover of three (3) feet below the flow line of the ditch or ground surface and five and one-half (5- 1/2) feet from the base of the rail. In fill sections, the natural ground line at the toe of the slope will be considered as ditch grade. The depth of cover shall not be less than that meeting applicable industry standards.

c. For all boring and jacking installations under main and passing tracks, greater than 26 inches in diameter, and at a depth of between 5.5 and 10.0 feet below top of tie, a geotechnical study will need to be performed to determine the presence of granular material and/or high-water table elevation, at the sole expense of the Permittee. The study will include recommendations and a plan for a procedure to prevent failure and a collapse of the bore. Generally, core samples are to be taken near the ends of a tie at the proposed location, at least as deep as the bottom of the proposed horizontal bore. Test results must be reviewed and approved by RFTA, or its agent, prior to boring activities commencing. RFTA reserves the rights, based on test results, to require the Permittee to select an alternate location or to require additional engineering specifications be implemented, at the sole expense of the Permittee, in order to utilize existing location.

d. The use of a plastic carrier pipe for sewer, water, natural gas, and other liquids is acceptable under specific circumstances. The use of plastic pipe is satisfactory if the pipe is designed to meet all applicable federal and state codes, and if the carrier pipe is properly encased within a steel casing pipe per AREMA standards. This casing must extend the full width of the right of way. Casing may be omitted only for gaseous products if the carrier is placed ten (10) feet below the base of rail per AREMA standards.

2. General Design and Construction Requirements

a. If the minimum depth is not attainable because of existing utilities, water table, ordinances, or similar reasons, the line shall be rerouted.

b. Locations that are considered unsuitable or undesirable are to be avoided. These include deep cuts and in wet or rocky terrain or where it will be difficult to obtain minimum depth.

c. Underground installations may be made by open-trenching from the property line to the toe of the fill slope in fill sections and to the toe of the shoulder slope in cut sections but to

no closer than thirty (30) feet of the centerline of the track. The remainder will be tunneled, augured, jacked or directional-bored through the roadbed. Refer to the following sections for required encasement of utilities and boring requirements.

d. Manholes should be located outside the railroad property, when possible. No manhole will be located in the shoulder, shoulder slope, ditch or backslope, or within twenty-five (25) feet of the centerline of the track, and shall not protrude above the surrounding ground without the approval of RFTA.
e. Utilities will not be attached to or routed through drainage structures or cattle passes. Utilities are not to be attached to other railroad structures without written approval of RFTA.
f. Jacking/boring pits shall be located a minimum of thirty (30) feet from the centerline of the track and kept to the minimum size necessary.
g. Under-track bores shall be located greater than 150 feet from the nearest bridge, culvert, track switch, building or other major structure.

3. Pipeline Requirements

a. Pipeline designs are to specify the type and class of material, maximum working pressures and test, and design pressure. Pipelines which are not constructed, operated and maintained under regulations established under US Department of Transportation Hazardous Materials Regulations Board, shall upon revisions in the class of material or an increase in the maximum operating pressure, must obtain RFTA approval.
b. Pipelines carrying oil, liquefied petroleum gas, natural or manufactured gas, and other flammable products shall conform to the requirements of the current AREMA, ANSI/ASME B 31.4 Code for pressure piping - Liquid Petroleum Transportation Piping Systems; ANSI B 31.8 Code for pressure piping - Gas Transmission and Distribution Piping Systems; other applicable ANSI codes and 49 C.F.R. Part 192 or Part 195 - Transportation of Hazardous Liquids by Pipeline, except that the maximum allowable stress of design of steel pipe shall not exceed the following percentages of the specified minimum yield strength (multiplied by longitudinal joint factor) of the pipe as defined in the ANSI codes.
c. Pipelines under railroad tracks and across railroad property shall be encased in a larger pipe or conduit called “casings.” Generally, casings shall extend from right-of-way line to right-of- way line, unless otherwise approved.
d. Pipelines and casing pipes shall be suitably insulated from underground conduits carrying electric wires on railroad property.
e. Reinforced concrete pipe will need to be encased for a distance as wide as the embankment at the utility crossing. This is to protect against track failure due to joint separation.

4. Encasement of Utilities

a. Casings are oversized load-bearing conduits or ducts through which a utility is inserted:
    1) To protect RFTA from damages and to provide for repair, removal, and replacement of the utility without interference to railway traffic.
    2) To protect the carrier pipe from external loads or shock, either during or after construction.
    3) To convey leaking fluids or gases away from the area directly beneath the railroad trackage to a point of venting at RFTA’s property line.
b. Casings may be omitted for **gaseous products only** under the following circumstances:
    1) Carrier pipe must be steel and the wall thickness must conform to E-80 loading

for casing pipe shown in the tables as included in the AREMA manual Chapter 1, Part 5 for Pipeline Crossings. The length of thicker-walled pipe shall extend from railroad right-of-way line to right-of-way line. This will generally result in a thicker-walled pipe on railroad right-of-way.

2) All steel pipe shall be coated and cathodically protected.
3) The depth from the base of rail to top of pipe shall not be less than ten (10) feet below the base of the rail. The depth from ditches or other low points on railroad right-of-way shall not be less than six (6) feet from ground line to top of the pipe.

c. In circumstances where it is not feasible to install encasement from right-of-way line to right-of-way line, casing pipe under railroad tracks and across railroad property shall extend to the greater of the following distances, measured at right angles to the centerline of track:
    1) Two (2) feet beyond the toe ofthe slope.
    2) Three (3) feet beyond ditch line.
    3) Twenty-five (25) feet from the centerline of outside track when the casing is sealed at both ends.
    4) Forty-five (45) feet from the centerline of outside track when the casing is open at both ends.
    5) If an additional track is planned for future construction, the casing must extend far enough to meet above distances given the additional track requirement.

d. Pipelines and casing pipe shall be suitably insulated from underground conduits carrying electric wires on railroad property.

e. Casing pipe and joints shall be made of metal and of leakproof construction. Casings shall be capable of withstanding the railroad loadings and other loads superimposed upon them.

f. Wall thickness designations for steel casing pipe for E-80 loading (including impact) are:

Nominal Diameter, (Inches)	Min. Thickness for Coated (Inches)	Non Coated (Inches)
14 and Under	0.188	0.188
16	0.219	0.281
18	0.250	0.312
20 and 22	0.281	0.344
24	0.312	0.375
26	0.344	0.406
28	0.375	0.438
30	0.406	0.469
32	0.438	0.500
34 and 36	0.469	0.531
38, 40 and 42	0.500	0.563
44 and 46	0.531	0.594
48	0.563	0.625
50	0.594	0.656

52	0.625	0.688
54	0.656	0.719
56 and 58	0.688	0.750
60	0.719	0.781
62	0.750	0.813
64	0.718	0.844
66 and 68	0.813	0.875
70	0.844	0.906
72	0.875	0.938

1) Steel pipe shall have a minimum yield strength of 35,000 pounds per square inch.
2) All metallic casing pipes are to be designed for effective corrosion control, long service life and relatively free from routine servicing and maintenance. Corrosion control measures for metallic carrier piping must include cathodic protection.
3) Cast iron may be used for casing. It shall conform to ANSI A21. The pipe shall be connected with mechanical-type joints. Plain-end pipe shall be connected with compression-type couplings. The strength of the cast iron pipe to sustain external loads shall be computed in accordance with the most current ANSI A21.1 "Manual for the Computation of Strength and Thickness of Cast Iron Pipe."

g. The inside diameter of the casing pipe shall be such that the carrier pipe can be removed without disturbing the casing. All joints or couplings, supports, insulators or centering devices for the carrier pipe shall be considered in the selection of the casing diameter.

h. For flexible casing pipe, a minimum vertical deflection clearance of the casing pipe shall be three percent (3%) of its diameter plus one-half (1/2) inch so that no loads from the roadbed, track, railroad traffic or casing pipe are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the relationship of the casing size to the size of the carrier pipe is:

Equals Diameter of Carrier Pipe Plus	Inside Dia. of Casing Pipe Outside Dia. of Carrier Pipe
0" - 8"	2"
10" - 16"	3-1/4"
Over 16"	4-1/2"

5. Casing and Pipeline Installation

a. Casing and pipeline installations should be accomplished by directional boring (see appendix page A-8), jack-and-bore, tunneling or other approved methods. Tunneling construction under tracks will be permitted only under direct supervision of a RFTA Engineer. Tunneling procedures and equipment, as well as structural design, must have RFTA Engineering approval prior to starting any work on RFTA property. Generally, tunneling shall not be considered where less than six (6) feet of cover exists, or where excessively sandy, loose or rocky soils are anticipated.

Rail elevations over intervals prescribed by RFTA to detect any track movement. Movements of over one-quarter (1/4) inch vertically shall be immediately reported to the RFTA. Due to the danger to rail traffic that is caused by only small amounts of track movement, RFTA forces may have to be called to surface the track severaltimes.

The following requirements shall apply to these construction methods:

1) The use of water under pressure jetting or puddling will not be permitted to facilitate boring, pushing or jacking operations. Some boring may require water to lubricate cutter and pipe, and under such conditions, is considered dry boring.
2) Where unstable soil conditions exist, boring or tunneling operations shall be conducted in such a manner as not to be detrimental to the railroad being crossed.
3) If excessive voids or too large a bored hole is produced during casing or pipeline installations, or if it is necessary to abandon a bored or tunneled hole, prompt remedial action should be taken by the Utility Owner.
4) All voids or abandoned holes caused by boring or jacking are to be filled by pressure grouting. The grout material should be sand cement slurry with a minimum of two (2) sacks of cement per cubic yard and a minimum of water to assure satisfactory placement.
5) The hole diameter resulting from bored or tunneled installations shall not Exceed the outside diameter of the utility pipe, cable or casing (including coating) by more than one and one-half (1-1/2) inches for pipes with an inside diameter of twelve (12) inches or less, or two (2) inches on pipes with an inside diameter greater than twelve (12) inches.
6) Pits for boring, tunneling or jacking will not be permitted within thirty (30) feet of the centerline of the track; or closer to the track than the toe of fill slopes in fill sections, or toe of shoulder slopes in ditch sections when pipes are allowed on RFTA's property.

b. Vents. In casing pipe installations, vents are appurtenances by which fluids or gases between carrier and casing may be inspected, sampled, exhausted or evacuated.

1) Vents shall be located at the high end of short casings and at both ends of casing longer than one hundred fifty (150) feet.
2) Vent standpipes shall be located and constructed so as not to interfere with maintenance of the railroad or to be concealed by vegetation. Where possible, they shall be marked and located on the property line. The markers shall give the name and address of the owner, and a phone number to contact in case of emergency.
3) Casing pipe, when sealed, shall be properly vented. Vent pipes shall be of sufficient diameter but in no case less than two (2) inches in diameter and shall be attached near each end of the casing, projecting through the ground surface at property lines.
4) Vent pipes shall extend not less than four (4) feet above ground surface. Top of vent pipes shall be fitted with a down-turned elbow, properly screened; or a relief valve.
5) For pipelines carrying flammable materials, vent pipes on casings shall be at least 16 feet (vertically) from aerial electric wires. Casings shall be suitably insulated from underground conduits carrying electric wires on Railroad right-of-way.

c. **Shut-Off Valves**

1) The Utility Owner shall install accessible emergency shut-off valves within effective distances on each side of the railroad. Where pipelines are provided with automatic control stations, no additional valves will be required.
2) Locating a shut-off valve on railroad property should be avoided. If approval is acquired, a guardrail must protect the shut-off valve.
3) When a guardrail is required, its height shall be four (4) feet above the ground line. All corner posts shall be driven to a minimum depth of four (4) feet below the ground line. There shall be a minimum clearance of two (2) feet from the valve to the guardrail. The steel pipes for the four corner posts and guardrail shall have a minimum diameter of four (4) inches. All joints will be welded with a one-quarter (1/4) inch fillet weld all around.

6. Water Lines

a. Where casing pipe is used, venting is not required; however, sealing will be required if the ends of the casing are not above high water.
b. Where non-metallic pipe is permitted and installed, steel casings are required from right-of-way line to right-of-way line.
c. Manholes should be located outside RFTA's property. Manholes shall not be located within twenty-five (25) feet of railroad trackage, in the shoulder, shoulder slope, ditch or backslope; and shall not protrude above the surrounding ground without the approval of RFTA.
d. The Utility Owner shall place a readily identifiable and suitable marker at each railroad property line where it is crossed by a water line.

7. Sewer Lines

a. New and relocated sewer lines shall be constructed with satisfactory joints, materials, and designs which will provide damage from sulfide gases and other corrosive elements to which they may be exposed.
b. Where casing pipe is used, venting and sealing of casing will be required on pressurized lines.
c. Where non-metallic pipe is permitted and installed, a durable metal wire shall be concurrently installed; or other means shall be provided for detection purposes.
d. Manholes should be located outside RFTA's property. Manholes shall not be located within twenty-five (25) feet of railroad trackage, in the shoulder, shoulder slope, ditch or backslope; and shall not protrude surrounding ground without the approval of RFTA.

8. Electric Power Lines

a. A minimum depth of 5.5 feet below the base of rail (BBR) will be maintained.
b. A minimum depth of 3.0 feet below natural grade (BNG) will be maintained for 750 volts and less, and 4.0 feet BNG for greater than 750 volts.
c. The wireline must be encased completely across RFTA's right-of-way with a rigid conduit. The conduit can be metal or high-density polyethylene (HDPE).
d. Crossings shall not be installed under or within 50 feet of the end of any Railroad bridge, the centerline of any culvert or switch area.
e. A RFTA signal representative must be present during installation if railroad signals are

in the vicinity of wireline crossings unless signal representative authorizes otherwise.

f. Markers that identify the Utility Owner shall be placed at both property lines for utilities crossing RFTA's property. For parallel lines, markers shall be placed above the cable at intervals no less than 300' apart. The markers should identify the owner, type of cable and emergency telephone number. A 6-inch wide warning tape will be installed, 1.0-foot BNG directly over the underground power line where located on Railroad right-of-way outside the track ballast sections.

g. Above-ground utility appurtenances installed as a part of an underground installation shall be located at or near RFTA's property line and shall not be any closer than twenty-five (25) feet to the centerline of the track.

9. Fiber Optic Lines.

a. The same requirements for electric power line crossings will apply for fiber optic line crossings except for the following:

b. A minimum depth of 4.0 feet BNG for fiber optic cable wirelines.

c. RFTA Engineering must approve any specialized equipment used to install cable. No rail plow will be allowed for installation purposes.

d. Schedule 80 HDPE pipe is acceptable (with no casing pipe) for use when housing fiber optic lines. A metallic ribbon or wire must be included in the pipe to allow for radio locating at a later date.

10. Abandonment/Removal of Facilities

a. Upon termination of the license, the pipeline needs to be removed from RFTA property except for the portion under the track embankment. For pipelines crossing under the tracks, the pipe and casing will be cut just short of the toe of embankment slope, purged and filled with a flowable –polymer grout (see appendix page A-9).

PART 4 - PLANS, APPROVALS AND PROCEDURES

A. Plans and Approvals

1. Design

a. The design of all utility installations will be the responsibility of the Utility Owner.

b. The plans for the proposed installation shall be submitted with the application and have RFTA approval before construction is initiated.

c. Plans shall be drawn to scale showing the relationship of the proposed utility line to the railroad tracks, the angle of crossing, the location of valves and vents, the railroad milepost and engineering station, railroad property lines and general layout of tracks and other railroad facilities. The plans should include a cross-section (or sections) from the field survey that will show utility placement to actual ground and tracks. If tunneling is proposed, a method of supporting tracks or driving of tunnel shall be shown. The geotechnical study, when required, should be included.

d. The plans should contain the following data for carrier pipe and casing

pipe: Contents to be carried
Inside diameter
Pipe material
Specifications and grade of material
Wall thickness
Actual working pressure

Type of joints
longitudinal joint factor
Coating
Method of installation
Vents-Number, Size, Height above
ground Seals-Both ends, One-end
Cover (top of tie to top of pipe or casing)
Cover (other than under tracks)
Cover (at ditches)
Cathodic protection
Type, Size and Spacing of insulators or supports

e. When a geotechnical study is required, the findings and protection plan shall be prepared by a licensed civil engineer and included with the plans. The geotechnical crew will need to be properly permitted to enter RFTA right-of-way and a RFTA flagman will be required when working within 25 feet of the track.

2. Approvals
   a. Approval of plans and application forms is required for all installations of utilities prior to initiation of work on RFTA property.
   b. If surveying is necessary for the completion of an application, a "Right of Entry" or "Temporary Occupancy Permit" must be executed and referenced.

B. License Procedures

1. Submit applications to: RFTA -1340 Main Street
   Carbondale, Colorado 81623
   970.384.4982 or
   ahenderson@rfta.com
   apascoe@rfta.com
   www.rfta.com

2. Upon receipt of the application, a letter will be forwarded acknowledging receipt and advising of the Permit & Contract file reference number and the person who should be contacted for further inquiries.

3. Office Hours: 9:00 A.M. to 5:00 P.M. Monday through Thursday.

4. Agreements will be required for all encroachments on railroad property.

5. Generally, agreement-processing time will be thirty to sixty days. Please allow sufficient lead- time for document handling prior to desired construction date. Before construction begins, agreements must be executed by Utility Owner and returned. Verbal authorizations will not be granted or permitted. A minimum of seventy-two (72) hours advance notice after execution of an agreement will be required prior to initiation of construction.

6. License fees must be submitted at the time the agreement is executed and returned.

7. Applications are to be made on the standard application form including an Exhibit "A."

C. Construction

1. The execution of the work on railroad property shall be subject to the inspection and direction of the RFTA or his representative.

2. A representative of RFTA must be present during installation if railroad signals are in the vicinity of the proposed construction.

PART 5 - JACKING-BORING-HDD-MICRO-TUNNELING- PIPE RAMMING OPERATIONS ON RFTA PROPERTY

Any installation of utilities using normal industry standard, RFTA approved methods of installation of pipeline or conduit on RFTA property will require special care and attention to the prevention of undesired failures during the construction process that affects RFTA and its neighbors in the community.

RFTA will require a copy of the as-built drilling log for any construction project under RFTA controlled property.

Temporary lines to bypass a construction project to carry the product on an interim basis will not be allowed without RFTA's written knowledge and consent. Major changes in alignment or profile of the utility installation may require the stoppage of work until RFTA can review and approve the changes.

A soils report and geotechnical evaluation are required to be submitted to RFTA prior to commencing any work.

The removal of any pipeline or casing facility and filling of any voids left behind with suitable approved materials will be required. Any pipe left in place for structural or integrity reasons must be approved by RFTA.

If during construction, failure in the jacking/drilling/ tunneling operation requires the recovery of a workhead, sonde, pig, tunneling shield etc. by open cut excavation methods, a RFTA representative must be present and confirmation of no conflicts with other underground utilities in the area by UNCC/811 (http://colorado811.org Underground Notification Center of Colorado).

Where drilling fluid or other lubricants are used in the underground drilling/boring/tunneling process, contingency plans for "frac-outs" and sudden loss of drilling fluid must be in place prior to the commencement of work. Loss of drilling fluid outside of normal parameters must be explained to RFTA's inspectors during construction. Placement of polymer fluids to fill voids and to promote cathodic protection must note the volume of material placed and the composition of that material.

RFTA supports the use of NUCA (National Utilities Contractors Association, http://nuca.com/) safety guidelines for underground utility construction.

Any spilled product, sewage, chemical or hazardous material must not be left unattended and cleaned- up/ remediated immediately to RFTA's satisfaction

All product in pipelines under pressure and many wirelines require the installation of the casing to protect the carrier pipe or wireline. (Natural gas pipelines are accepted in some cases and require different protection stated elsewhere in the guidelines and standards). During construction or repairs, the materials, lubricants, fuels, etc. used on the project must be carefully accounted for and contingencies for spills and or other failures must be taken into account. The contingencies, including product to be carried in the pipeline include:

1.) FLAMMABLE/ VOLATILE PRODUCT ON RFTA R/W

RFTA requires encasement of pipelines transporting liquids under pressure across, over, or under the former railroad corridor. The encasement, when installed in accordance with the guidelines, standards and recommended the practice of RFTA, permits the pipeline operating company to install a facility of usual design, at or near, a usual depth of cover or a usual overhead clearance requirement.

Installation of the encasement pipe prior to pipeline construction activities reduces the risk of delay caused by encountering unanticipated facilities, poor subsurface conditions, or difficult attachment at the crossing location. The encasement affords the pipeline and railroad companies a measure of protection from damage to their operating facilities resulting from the actions of unauthorized parties, or the errant actions of authorized parties. Additionally, it shields the pipeline from potential physical damage as a result of the derailment, thus reducing the risk of product loss in the surrounding soil and promoting the earliest possible safe return to operation of the pipeline facility. By conducting the flow of lost product to the outerlimits of RFTA's right-of-way, the risk of delay or curtailment of railroad operations during repair and cleanup activities is reduced. Allowing both the railroad (RFTA) and pipeline companies to resume safe operation of their facilities as quickly as possible following an event serves the interests of the public, RFTA, and the pipeline company. The only exception to the above-listed RFTA "casing rule" and position is for that of a normally operating natural gas pipeline with heavy wall steel pipe as shown earlier in this section.

a. Gas – All gaseous product allowed to cross RFTA property by pipeline or stored in tanks is subject to federal regulation as shown in federal regulation 49CFR Parts 100 to 185 and 49CFR Parts 190 to 199 as administrated by the Pipeline & Hazardous Materials Safety Administration (http://www.phmsa.dot.gov/). All spills and breaches of tanks or pipelines must be reported immediately to RFTA and the proper local authorities at the local, state and federal level. RFTA and the public must be protected against coming into contact with or being put at risk by any spilled/ leaked material. A risk management and mitigation plan, along with an emergency action plan must be in place and available on site prior to the commencement of any maintenance or construction work on RFTA property. Any inhalation hazards must be clearly identified and protected against.
b. Liquid – All liquid hazardous material product allowed to cross RFTA property by pipeline or stored in tanks is subject to federal regulation as shown in federal regulation 49CFR Parts 100 to 185 and 49CFR Parts 190 to 199 as administrated by the Pipeline & Hazardous Materials Safety Administration (http://www.phmsa.dot.gov/). All spills and breaches of tanks or pipelines must be reported immediately to RFTA and the proper local authorities at the local, state and federal level. RFTA and the public must be protected against coming into contact with or being put at risk by any spilled/ leaked material. A risk management and mitigation plan, along with an emergency action plan must be in place and available on site prior to the commencement of any maintenance or construction work on RFTA property. Any inhalation hazards, especially where the liquid to gas risk exists, must be clearly identified and protected against.

2.) NON- FLAMMABLE PRODUCT ON RFTA R/W

a. Water – Water crossing RFTA property must be identified as potable or non- potable in nature. In case of breach or leak of the pipeline, the water source must be cut off prior to reaching the RFTA right-of-way line. Failure to cut off the water may result in saturated subgrade, subgrade failure or washout. Ponding of water on RFTA right of way is not allowed/ discouraged. Retention of non-potable water for remediation may be required in some situations. In those cases, removal of the ponded material to a proper treatment facility is a priority and must be completed without delay. For sewage, see below.

b. Sewage/ Sludge – Report all sewage spills to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee immediately. Minor spills requiring immediate attention may be disinfected with regular garden lime from a garden shop. Follow the lime container's label instructions. Sprinkle the lime onto the spill so the spill is dusted mostly white on the surface. If the residue is thicker in some places use a rake to mix the lime and the residue. After a day, rake up the thicker residue and place it in a trash bag for disposal with the other trash. Use a sprinkler or hose to water the lime and residue into the soil. Let the area dry in the sun a day before allowing access. If there is still white lime dust visible on the spill area, water it in until the white dust is gone. County health departments should be contacted to verify and consult on the resulting clean-up.

   Major sewage spills will require remediation of an accredited environmental remediation contractor. Sewage may contain heavy metals, volatile organic compounds, and other potentially hazardous materials. RFTA reserves the right to demand testing and remediation reports by a qualified consulting engineer/ environmental chemist to find the best way to remediate a potential spill site and to protect the public health. In the case of planned repairs/ modifications, an approved submittal on the handling of upstream influent in the sewer system must be submitted prior to the commencement of work. Detention/retention ponding sites must meet RFTA/City/County guidelines.

c. Non-Flammable liquids must be clearly identified as pipeline product. Storage, even temporary, of any liquid product will require a covered spill containment system capable of handling up to 120% of the volume of the stored material.

d. Chemical. Any spilled chemical agent, no matter how small the quantity, must be reported to RFTA immediately. Storage of chemical agents on RFTA property is prohibited without direct written permission by RFTA. Any chemical agent stored on RFTA R/W for any period of time must be stored in a spill containment vessel with a spill retention capacity of 120% of stored material's volume.

INTERIM GUIDELINES FOR HORIZONTAL DIRECTIONAL DRILLING (HDD) UNDER RFTA'S RIGHT OF WAY

Preface: The American Railway Engineering and Maintenance-of-Way Association (AREMA) has assigned a working committee to develop a recommended railroad industry practice for horizontal directional drilling (HDD) under railroad rights-of-way. These interim guidelines are adopted by

RFTA pending completion of the AREMA recommended the practice, at which time RFTA will review and determine whether to adopt it.

Scope: All pipelines proposed for installation under RFTA right-of-way and trackage using HDD. Fiber optics installation under the jurisdiction of the UPRR Information Technologies (IT) Department with 10 inches or smaller diameter casing pipe shall follow the guidelines outlined in the current version of the" Fiber Optic Engineering, Construction, and Maintenance" Standard Manual.

1. For all liquid or gas pipelines, only steel pipe may be installed under tracks or RFTA right- of-way utilizing HDD. The pipe may be used as a carrier pipe or a casing pipe. Plastic carrier pipe, if used, must be installed in a steel casing.
2. For fiber optics (not under the jurisdiction of UPRR IT Department) or electrical installations, plastic (PVC or HDPE) pipe may be used as a conduit.
3. For all liquid or gas installations, with casing not exceeding 63 in., minimum cover (measured from base of rail to top of pipe) shall be 12 ft, regardless of product. For fiber optics or electrical installations, with the casing/conduit nominal size of 6 in. or less, the minimum cover shall be 12 ft. Applicant submittal shall include actually planned depth of pipe under each railroad track.
4. Applicant must provide pipe specifications. Pipe must satisfy AREMA recommendations and all applicable government and industry regulations.
5. Applicant must provide qualifications of drilling contractor including specific instances of previous successful experience in drilling under sensitive surface facilities.
6. Prior to commencement of drilling:
   A. The contractor must submit an Installation Plan that describes the anticipated rig capacity, the proposed equipment and the method for advancing the borehole through expected soil conditions, angles, depth and exact location of the exit ditch, the pilot hole diameter, the proposed reaming plan, including the number and diameter of pre-reams/back-reams and diameter of the final reamed borehole, and the contingency equipment and plans for dealing with soil conditions that a soil engineer could reasonably expect to be encountered at the proposed HDD installation site. The Installation Plan will also address the anticipated hours of operation during the HDD borehole drilling and installation process, the minimum number of personnel, and their responsibilities on-duty and on-site during all HDD drilling operations.

   B. The contractor must provide a detailed Fracture Mitigation (frac-out) Plan including the method of monitoring and capturing the return of drilling fluids with particular attention to prevention of inadvertent escape of drilling fluids where they could undermine the Railroad tracks.

   C. Establish a Survey Grid Line and provide a program of monitoring and documenting the actual location of the borehole during drilling operations.

7. A railroad observer and an applicant inspector are required to monitor the ground, ballast, and track for movement during the drilling, reaming, and pullback processes. All work within RFTA's right-of-way must be coordinated with the Railroad flagger. The installation process and all train immediately stopped if the movement is detected. The damaged area must be immediately

reported to the and immediately repaired subject to Railroad review and approval. The installation process must be reviewed and modified as required before the installation may proceed. Applicant must pay Railroad's expenses for review, observation of installation, and flagging.

8. Upon completion of the HDD installation work, the contractor shall provide an accurate as-built drawing of the installed HDD segment. As-built drawings will include both horizontal and profile plans.

PART 6 APPENDIX FORMS – FOLLOWING

(APPENDIX A-6)

APPLICANT'S PIPELINE CROSSING CHECKLIST

Installation must comply with the guidelines and standards herein.

Installation is located at least fifty (50) feet from the end of any railroad bridge or centerline of any culvert. Steel casing must extend completely across railroad property if carrier pipe is made of plastic.

Approval for installation may be given if the pipeline is uncased and the commodity is gaseous and the carrier pipe is made of steel, buried a minimum of ten (10) feet below the base of rail and six (6) feet below the ground line for its entire length across railroad property.

A RFTA Signal representative may be present during installation if railroad signals are in the vicinity

of installation unless plans have been approved prior to installation.

Applications and Policy are available online at: (to be provided once the Access Control Plan and these Design Guidelines and Standards are finalized)

(APPENDIX A-11)

DEFINITION OF TERMS

The terminology used in this Policy strives for conventional meaning and to ensure uniform interpretation. To this end, the following definitions apply:

ACCESS CONTROL: Restriction of access to and from abutting lands to railroad property.

AREMA: American Railroad Engineering and Maintenance of Way Association.

ANSI: American National Standard Institute.

ASTM: American Society for Testing and Materials.

BACKFILL: Replacement of soil around and over an underground utility facility.

BORING: Piercing a hole under the surface of the ground without disturbing the earth surrounding the hole. Boring may be accomplished by any approved manner. Water jetting or puddling will not be permitted. Holes may be mechanically bored and cased using a cutting head and continuous auger mounted inside of the casing. Small diameter holes may be augured and the casing or utility facility pushed in later.

BURY: Placement of the utility facility below the grade of the roadway, ditch or natural ground to a specified depth.

CARRIER: Pipe directly enclosing a transmitted fluid (liquid or gas).

CASING: A larger pipe enclosing a carrier.

CFR: Code of Federal Regulations.

COATING: Material applied to or wrapped around a pipe.

COMMUNICATION LINE: Fiber optic, telephone cable, and similar lines, not exceeding four hundred (400) volts to ground or seven hundred fifty (750) volts between any two (2) points of the circuit, the transmittal power of which does not exceed one hundred fifty (150) watts.

CONDUIT OR DUCT: An enclosed tubular runway for protecting wires or cables.

COVER: The depth of material placed over a utility. Depth of cover is measured from top of utility casing or carrier pipe (if no casing is required) to the natural ground line or construction line above the utility.

DIRECT BURIAL: Installing a utility underground without encasement, by plowing or trenching. No rail plows will be permitted.

ELECTRIC SUPPLY: Electric light, power supply, and trolley lines, irrespective of the voltage used for transmitting a supply of electrical energy.

ENCASEMENT: Structural element surrounding a pipe or cable.

FLEXIBLE PIPE: A plastic, fiberglass, or metallic pipe having a large ratio of diameter to wall thickness that can be deformed without undue stress. Copper or aluminum pipe shall be considered as a flexible pipe.

GROUNDED: Connected to the earth or to some extent which intentionally or accidentally is connected with the earth.

GROUT: A cement mortar or slurry of fine sand or clay as conditions govern.

HORIZONTAL DIRECTIONAL DRILLING: A steerable trenchless method of installing underground pipes, conduits, and cables in a shallow arc along a prescribed bore path by using a surface launched drilling rig, with minimal impact on the surrounding area.

JACK-AND-BORE: The installation method whereby the leading edge of the jacked pipe is well ahead of the cutting face of the auger bit. The auger is removing waste from inside the pipe as it is being jacked. This method greatly reduces the likelihood of subsidence of granular material during installation.

JACKING: The installation of small pipes by the use of hydraulic jacks or rams to push the pipe under the traveled surface of a road, railroad roadbed, or another facility.

LICENSE:
UTILITY LICENSE AGREEMENTS are executed for all utility facilities located on railroad property.

MANHOLE: An opening to an underground utility system which workmen or other may enter for the purpose of maintaining, inspecting, or making installations.

NATURAL GAS PIPELINES:
DISTRIBUTION SYSTEM - A pipeline other than a gathering or transmission line.

SERVICE LINE - A distribution line that transports gas from a common source of supply to a customer meter.

TRANSMISSION SYSTEM - A pipeline other than a gathering line that transports gas from a gathering line or storage facility to a distribution center or storage facility. It operates at a hoop stress of twenty percent (20%) or more of the Specified Minimum Yield Strength.

NORMAL: Crossing at a right angle.

PERMITS:
PERMIT TO BE ON RFTA PROPERTY FOR UTILITY SURVEY is to be executed prior to all survey work on railroad property.

PIPE: A tubular product made as a production item for sale as such. Cylinders formed from a plate in the course of fabrication of auxiliary equipment are not pipes as defined here.

PRESSURE: Relative internal pressure in PSI (pounds per square inch) gauge.

PRIVATE LINES: Any privately-owned facilities which convey or transmit the commodities outlined under the definition for Utilities but are devoted exclusively to private use.

PUBLIC LINES: Those facilities which convey or transmit the commodities outlined under the definition for Utilities and directly or indirectly serve the public or any part thereof.

RIGHT OF WAY: A general term denoting land, the property of interest therein, usually in a strip, acquired for or devoted to railroad transportation purposes.

SEAL: A material placed between the carrier pipes and casing to prevent the intrusion of water, where ends of the casing are below the ground surface.

SHOULDER: That portion of the roadbed outside the ballast.

TRENCHED: Installed in a narrow excavation.

TUNNELING: Excavating the earth ahead of a large diameter pipe by one or more of the following processes:
1) The earth ahead of the pipe will be excavated by men using hand tools while the pipe is pushed through the holes by means of jacks, rams or other mechanical devices, 2) The excavation is carried on simultaneously with the installation of tunnel liner plates, and/or 3) The tunnel liner plates are installed immediately behind the excavation as it progresses and are assembled completely away from the inside.

UTILITY OWNER: All privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, stormwater and other similar commodities, including fire and police signal systems and street lighting systems which directly or indirectly serve the public.

(APPENDIX A-14)

REFERENCES

American National Standards Institute (ANSI) Codes, 1430 Broadway, NY, NY 10018. American Railway

Engineering and Maintenance of Way Association (AREMA) Specifications. American Society for Testing and Materials (ASTM) Specifications.

American Water Works Association Standards and Specifications, AWWA, 2 Park Avenue, NY, NY

10016. Manual on Uniform Traffic Control Devices - with revisions, US Department of

Transportation, Federal Highway Administration.

National Electrical Safety Code, US Department of Commerce, National Bureau of Standards.

Pipeline Safety Regulations - Code of Federal Regulations, Title 49 - Transportation, Parts 191-192-

Natural Gas; Part 195-Liquid Petroleum Gas.

Rules and Regulations for Public Water Systems - latest edition, State Health Departments.

Rules and Regulations promulgated by the Hazardous Materials Regulation Board of the US Department of Transportation.

Statutory Provisions, 23 U.S.C. 109 and 111.

4. Guideline for Railroad Grade Separation Projects

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Guideline for Railroad Grade Separation Projects

1.0 INTRODUCTION

1.1 Purpose

The purpose of these Guidelines is to inform Applicants, Contractors and other parties concerned with Railroad policies, requirements, and standards for the design and construction of Grade Separation Projects. Compliance with these Guidelines is required to achieve uniformity in the preparation of construction documents for Grade Separation Projects and to expedite the review and approval by RFTA of design and construction submittals.

The purpose of review by RFTA is solely to ensure compliance with the minimum standards of RFTA dealing with particular areas of concern to rail transportation and not to warrant the general safety of the structure.

Note: References to the Railroad, Railroad Operations, and Engineer, all refer to RFTA, their consultants, and designated assigns, and include all uses of the corridor consistent with the RFTA ACP, including the Rio Grande Trail and related public uses.

1.2 Definitions

Access Road:

A road used and controlled by RFTA for maintenance, inspection, and repair.

Applicant:

Any party proposing a grade separation project on Railroad right-of-way or other Railroad operating location, regardless of the track being active or out of service.

AREMA:

The current edition of the American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering.

AASHTO:

The current edition of the American Association of State Highway and Transportation Officials Standard Specifications for Highway Bridges.

C & M Agreement:

A Construction and Maintenance Agreement that has been negotiated between RFTA and the Applicant that addresses all the duties and responsibilities of each party regarding the construction of the proposed grade separation and the maintenance requirements after the construction of the said structure.

Construction Documents:

Refers to design plans and calculations, project and/or standard specifications, geotechnical report and drainage report.

Contractor:

The individual, partnership, corporation or joint venture and all principals and representatives (including Applicant's subcontractors) with whom the contract is made by the Applicant for the construction of the Grade Separation Project.

Crossover:

A track connection between two adjacent tracks.

Construction Window:

A timeframe in which construction or maintenance can be performed by the Contractor with the required presence of a Flagman.

Multiple Main Tracks:

Two or more parallel or adjacent main tracks.

Engineer-of-Record:

The Professional Engineer that develops the criteria and concept for the project and is responsible for the preparation of the Plans and Specifications. The Engineer-of-Record shall be registered in the state of the project location. The Engineer-of-Record may be the Applicant's in-house staff or a consultant retained by the Applicant. The Contractor shall not employ the Engineer-of-Record as the Contractor's Engineer-of-Record or as a Specialty Engineer, with the exception of design-build projects.

Flagman:

A qualified employee of RFTA providing protection from Railroad operations per Railroad requirements.

Guidelines:

Refers to the information contained in this document or referenced in AREMA or AASHTO.

Grade Separation Project:

A project that includes an Overhead or Underpass Structure that crosses RFTA right-of-way or other Railroad operating location regardless of track status being active or out of service.

Main Track:

A track extending through yards and between stations that must not be occupied without proper authority.

Overhead Structure:

A Roadway and Trail or pedestrian Structure over RFTA's right-of-way.

Railroad Local Representative:

The individual designated by RFTA as the primary point of contact for the project.

Railroad:

Refers to RFTA and/or Union Pacific Railroad.

Railroad Right-of-Entry Agreement:

An agreement between RFTA and an Applicant or a Contractor allowing access to Railroad property.

Siding:

A track connected to the main track and used for meeting, storing or passing trains.

Single Track:

The main track where trains operate in both directions.

Timetable:

A Railroad publication with instructions on train, engine or equipment movement. It also contains other essential Railroad information.

Trail:

A pathway impacting Railroad right-of-way or other Railroad operating locations regardless of track status being active or out of service. This includes pedestrian, bicycle, and approved motorized recreational equipment and equestrian uses.

Underpass Structure:

A Railroad Structure over a Roadway and/or Trail.

Yard:

A system of tracks, other than main tracks and sidings, used for making up trains, storing cars and other purposes.

Yard Limits:

A portion of main track designated by "yard limit" signs and included in the timetable special instructions or a track bulletin.

1.3 Guidelines and References

These Guidelines are provided for reference only and are subject to revision without notice. These Guidelines cannot be taken as authority to construct. Railroad approval of construction documents, execution of a Construction and Management (C & M) Agreement and Railroad Right-of-Entry Agreement (if applicable) are required prior to beginning construction.

These Guidelines supplement the current (AREMA) Manual for Railway Engineering, AASHTO and State Railroad Regulatory Body requirements. Where these Guidelines and the documents referenced in the preceding sentence differ, these Guidelines willgovern.

The AREMA Manual is available from:

American Railway Engineering and Maintenance-of-
Way Association 4501 Forbes Blvd., Suite 130
Lanham, MD 20706 – 4362
Phone: (301) 459-3200
Attn: Beth Caruso, Publications Manager
Ext. 701 FAX: (301) 459 8077
www.arema.org

The specific Railroad requirements for a Grade Separation Project, as addressed in this document, shall be followed at all locations where RFTA operates, regardless of track ownership or track status, either active or out of service.

Any items affecting Railroad property not covered in these Guidelines shall be subject to RFTA's prior review and approval.

All new or modified Overhead Structures or Underpass Structures shall be designed in accordance with the most current policies, requirements, and standards of RFTA. These guidelines do not apply to existing structures.

2. AGREEMENTS

2.1 Applicant and Contractor Responsibility

The Applicant, at its expense, shall be solely responsible for all costs, design, construction, future replacement, maintenance and serviceability of the proposed Grade Separation Project, except as noted otherwise in the C & M Agreement with RFTA. The Applicant shall develop design plans including, without limitation, all procedures necessary to construct and maintain the proposed Grade Separation Project, which cause no interruption to Railroad operations during and after construction. The Applicant must verify with RFTA Local Representative for the latest version of these guidelines prior to developing Construction Documents.

The Applicant shall be responsible for obtaining all Federal, State, local and other permits for construction of the Grade Separation Project.

The Applicant and/or the Engineer-of-Record have the ultimate responsibility and liability for the Construction Documents and liability for damages to Railroad property during and after the construction of the project.

The Contractor is responsible to comply with the construction documents prepared by the Applicant. The Contractor shall comply with Railroad requirements stated in the C & M Agreement prior to the commencement of any construction. The Contractor shall develop work plans that ensure the track(s) remain open to train traffic per Railroad requirements as stated in the C & M Agreement and meet the requirements of RFTA's Right-of-Entry Agreement (if applicable).

The Applicant is responsible for the security and safety of all people including the general public and trespassers, and the protection of Railroad infrastructure within the limits of the proposed Grade Separation Project. Any damage to Railroad property such as track, signal equipment or structure could result in a train derailment. All damages must be reported immediately to RFTA Local Representative in charge of the project and to RFTA.

The Applicant and Contractor are required to meet all safety standards as defined by RFTA, Federal Railroad Administration (FRA), Division of Occupational Safety and Health Administration (OSHA), Local, State, and Federal Governments and the State Railroad Regulatory Body.

2.2 Railroad Right-of-Way

The right-of-way accommodates existing tracks, drainage systems, multiple utilities, Access Roads and space for the future track(s). The proposed Grade Separation Project shall not limit current or future Railroad operating capacity and utility accommodations within RFTA’s right-of-way.

2.3 Railroad Right-of-Entry Agreement

The Applicant, Contractor or their representatives must sign RFTA's Contractor's Right-of-Entry Agreement (if applicable) and/or obtain a valid Right-of-Entry permit from RFTA and comply with all Railroad requirements when working within RFTA's right-of-way limits. Limits of Railroad right-of-way are to be located by the Applicant and identified on the plans.

2.4 Construction and Maintenance (C & M) Agreement

Any Overhead Structure or Underpass Structure impacting RFTA will require the Applicant to execute a C & M Agreement prior to any construction on Railroad right-of-way. The C & M Agreement cannot be signed without RFTA’s prior approval of construction documents.

The C & M agreement shall include a funding source, cost estimate, insurance and indemnification requirements, method of payment, responsibility for design, construction, ownership, maintenance and future replacement.

The Applicant shall own, maintain and replace the proposed Overhead Structure or Underpass Structure at no cost to RFTA and with no interruption to Railroad operations during construction, maintenance and future replacement of the Structure. RFTA shall, at its own expense, be responsible for ownership and maintenance of track components only.

The Applicant is responsible for performing the work in accordance with the terms specified in the C & M Agreement. This responsibility includes, without limitation, compliance with all Railroad requirements, Federal, State, and Local Laws and applicable county or municipal ordinances and regulations.

2.5 Railroad Review of Submittals and Construction Observation

The Applicant will be responsible for all costs associated with RFTA or its consultant's review of design and construction documents. Prior to any review, RFTA's Local Representative shall receive written notice from the Applicant agreeing to pay all costs associated with the review of the submittals and project site observations during design and construction phases of the project. Review expenses shall include all costs for in-house personnel and/or consultants retained by RFTA. Review cost is a function of the quality of submittals received from the Applicant. Regardless, all actual costs incurred by RFTA or its consultant during the plan review process and construction monitoring phase of the work shall be fully recoverable from the Applicant.

3. SUBMITTALS

3.1 RFTA Review Process

All design and construction submittals shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. RFTA shall have the option of reviewing the project documents in-house or by using an outside consultant. If an outside consultant is used to review the design documents, RFTA will arrange for communication with the Applicant to resolve design issues. During the review process, RFTA shall be the primary contact for resolving outstanding issues.

It should be noted that RFTA's review and approval of construction documents does not relieve the Applicant and/or Engineer-of-Record from the ultimate responsibility and liability for damages to Railroad property during and after construction of the proposed Grade Separation Project, nor does it relieve the Applicant and the Contractor from their responsibilities, obligations and/or liabilities under the C & M Agreement and the Contractor's Right-of-Entry Agreement (if applicable). Railroad's approval of construction documents will be given with the understanding that Railroad makes no representations or warranty as to the validity, accuracy, legal compliance or completeness of such documents and that any reliance by the Applicant, Engineer-of-Record or Contractor on such documents is at the risk of Applicant, Engineer-of-Record and Contractor.

3.2 Contractor Review

The Contractor must review all construction submittals to ensure that the materials and proposed method of construction are compatible with the existing site conditions. The Contractor's work plan must be developed to allow any current Railroad traffic to remain in service per Railroad requirements and C&M Agreement.

3.3 The applicant and/or Engineer-of-Record Review

The Applicant and/or Engineer-of-Record must review and approve each construction submittal for compliance with the construction documents, AREMA and/or AASHTO, and these Guidelines before forwarding the submittal to RFTA for review and approval.

3.4 Submittal Schedule

The Applicant shall schedule submittals per Tables 3-1 or 3-2 to ensure adequate time for review. The Applicant shall not expect a lesser time for review than that indicated in the tables nor shall RFTA be responsible for delayed design and construction. Partial, incomplete or inadequate submittals will be rejected, thus delaying the approval.

Revised submittals will follow the same procedure as the initial submittal until all issues are resolved. At the 100% submittal, prior to submission to RFTA, all design plans and calculations, project specifications/Special Provisions, the geotechnical report and the drainage report must be signed and stamped by a registered Professional Engineer familiar with RFTA requirements and licensed in the State where the project is located.

3.4.1 Design Submittals

The Applicant or their representative shall submit all applicable design submittals as shown in Table 3- 1 or 3-2 to RFTA for review and approval following their own internal review and approval of the submittal. Design plans shall be submitted in 11"x17" hard copy format as well as electronic .pdf format. See Plan No. 711100, sheets 2 and 3 and also Plan No. 711200, sheet 1 for additional information regarding items to be included in the Design Plans.

3.4.2 Design Calculations

Design calculations shall be provided for all structures, except Overhead Structures, to be constructed as part of the project. Design Calculations shall be clear, readable and easy to follow. The computer program generated output or data sheet calculations shall be accompanied by input data information and sample calculations to verify the accuracy of the computer output.

3.4.3 Geotechnical Report

A geotechnical report shall be provided covering all bridges and retaining walls. The preliminary geotechnical report shall include enough information to support foundation design calculations and backfill design requirements. The final geotechnical report shall have recommendations consistent with those used in the final structural design.

3.4.4 Drainage Report

A drainage report is required if the Grade Separation Project necessitates changes in existing drainage patterns or increases in drainage flow on Railroad right-of-way. See Section 4.5.2 and 4.5.3 for hydraulic criteria to be used.

3.4.5 Units

All controlling dimensions, elevations, design criteria, assumptions, and material stresses shall be expressed in English units. Dual units with English units in parenthesis are acceptable for projects that require the use of Metric units per Federal, State and/or Local government requirements.

3.5 Construction Submittals

The Applicant or their representative shall submit all applicable construction submittals defined in Tables 3-1 or 3-2 to RFTA for review and approval following their own internal review and approval of the submittal. The Engineer- of-Record's review comments must be submitted to RFTA along with the construction submittal.

Table 3-1, Overhead Structures

Phase		Type of Submittals	Format	Railroad Review Time
Design	**A**	Concept (Plans and Site Pictures	4 hard copies & PDF	4 weeks
	B	30% (Applicant response, Design Plans, Project Specifications, Drainage Report, Shoofly Design, Construction Phasing Plans)	4 hard copies & PDF	4 weeks
	C	100 % (Applicant response, Design Plans, Project Specifications, Drainage Report, Shoofly Design, construction Phasing Plans)	4 hard copies & PDF	4 weeks
Construction		Shoring Falsework Demolition Erection Erosion Control Construction Phasing Plans	4 hard copies & PDF	4 weeks

All .pdf files shall be submitted on Compact Disc (CD) or flash drive and may also be transmitted electronically via e-mail or through an internet ftp site

A. The Concept Submittal shall, at a minimum, include the following:

1. Plan, Elevation and Typical Section of proposed grade separation.
2. Photo log with pictures of the proposed project location. Site pictures shall be in all controlling directions including, but not limited to, North, East, South, and West. The plan view should show a reference location and direction for each picture.

Four (4) sets of the concept submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or

his/her designee. Allow four (4) weeks for in-house review from the time the submittal is received.

B. The 30% Submittal shall, at a minimum, include the following:

1. Applicant response to Railroad review comments on the concept submittal. The 30% submittal shall reflect concept review comments.
2. Design Plans showing a Plan View, Elevation View, Typical Section, and Railroad Profile Grade Diagram. See Plan No. 711100, sheet 2 for additional details. To include general notes per Plan No. 711100, sheet 3 and to indicate structure design criteria and construction methods.
3. Project Specifications and/or Special Provisions, including Railroad coordination requirements.
4. Drainage Report, if drainage is affected (See Section 3.4.4).
5. Shoofly Design. Bridge general plan shall show the location of the shoofly and indicate the footprint of the structure in relation to the centerline of shoofly and existing track(s). See Section 4.1.1.
6. Construction Phasing Plans. Construction Phasing Plans must show all required phasing, construction procedures, controlling dimensions and elevations. See Section 4.1.

Note: Fiber optic cables may be presently buried on the RFTA right-of-way or such installations may be scheduled. The presence of such facilities shall be considered in the project design and appropriate measures for the installation and protection of the fiber optic cables shall be addressed in the plans and contract documents.

Four (4) sets of the 30% submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow four (4) weeks for in-house review by RFTA from the time plans are received.

C. The 100% Submittal shall, at a minimum, include the following:

1. Applicant response to Railroad review comments on the 30% submittal. The 100% submittal shall reflect 30% review comments.
2. Design Plans showing Plan View, Elevation View, Typical Section, and Railroad Profile Grade Diagram. See Plan No. 711100, sheet 2 for additional details. To include general notes per Plan No. 711100, sheet 3 and to indicate structure design criteria and construction methods.
3. Project Specifications and/or Special Provisions, including Railroad coordination requirements.
4. Drainage Report, if drainage is affected (See Section 3.4.4).
5. Shoofly Design. Bridge general plan shall show the location of the shoofly and indicate the footprint of the structure in relation to the centerline of shoofly and existing track(s). See Section 4.1.1.
6. Construction Phasing Plans. Construction Phasing Plans must show all required phasing, construction procedures, controlling dimensions and elevations. See Section 4.1.

Four (4) sets of the 100% submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow four (4) weeks for review. Following final review and resolution of any outstanding issues, and upon receipt of four (4) sets of final signed and stamped Construction Documents, RFTA will issue a letter of project acceptance.

Table 3-2, Underpass Structures

Phase		Type of Submittals	Format	Railroad Review Time
Design	**A**	Concept (Plans and Site Pictures	4 hard copies & PDF	4 weeks
	B	30% (Applicant response, Type Selection Report, Design Plans, Shoofly Construction Phasing)	4 hard copies & PDF	4 weeks
	C	60 % (Applicant response, Design Plans & Calculations, Geotechnical Report, Project Specifications and/ or Special Provisions, Drainage Report, Shoofly Design, construction Phasing Plans)	4 hard copies & PDF	6 weeks
	D	100 % (Applicant response, Design Plans & Calculations, Geotechnical Report, Project Specifications and/ or special Provisions, Drainage Report & Plan, Shoofly Design, construction Phasing)	4 hard copies Micro station & PDF	4 weeks
Construction		Shoring Falsework Demolition Erection Erosion Control Shop Drawings Bearing shop drawings and material certifications Concrete Mix Design Structural Steel, Rebar and Strand Certifications 28-day Cylinder Test of Concrete Strength Waterproofing Material Certification Test reports for fracture critical members Foundation Construction Reports (eg. Pile driving records, caisson drilling and /or crosshole sonic log testing for drilled shafts).	4 hard copies & PDF	4 weeks

CAD and .pdf files shall be submitted on Compact Disc (CD) or flash drive and may also be transmitted electronically via e-mail or through an internet ftp site.

A. The Concept Submittal shall, at a minimum, include the following:

1. Plan, Elevation and Typical Section of proposed grade separation.
2. Photo log with pictures of the proposed project location. Site pictures shall be in all controlling directions including, but not limited to, North, East, South, and West. The plan view should show a reference location and direction for each picture.

Four (4) sets of the concept submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow four (4) weeks for in-house review by RFTA from the time the submittal is received.

B. The 30% Submittal shall, at a minimum, include the following:

1. Applicant response to Railroad review comments on the concept submittal. The 30% submittal shall reflect concept review comments.
2. Structure Type Selection Report.
3. Design Plans showing a Plan View, Elevation View, Typical Section, and Railroad Profile Grade Diagram. See Plan No. 711200, sheet 1 for additional details. Plans to include general notes to indicate structure design criteria, construction methods, and material compliance specifications.
4. Shoofly Design. Bridge general plan shall show the location of the shoofly and indicate the footprint of the structure in relation to the centerline of shoofly. See Section 4.1.1.
5. Construction Phasing Plans. Construction Phasing Plans must show all required phasing, construction procedures, controlling dimensions and elevations. See Section 4.1.

Note: Fiber optic cables may be presently buried on RFTA's right-of-way or such installations may be scheduled. The presence of such facilities shall be considered in the project design and appropriate measures for the installation and protection of the fiber optic cables shall be addressed in the plans and contract documents.

Four (4) sets of the 30% submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow four (4) weeks for in-house review by RFTA.

C. The 60% Submittal shall, at a minimum, include the following:

1. Applicant response to Railroad review comments on the 30% submittal. The 60% submittal shall reflect 30% review comments.
2. Design Plans and calculations including superstructure and substructure details, bearing details, deck and waterproofing details, miscellaneous bridge details, and a complete set of structural calculations (See Section 3.4.2).
3. Geotechnical Reports/recommendations (See Section 3.4.3).
4. Project Specifications and/or Special Provisions, including Railroad coordination requirements.
5. Drainage Report, if drainage is affected (See Section 3.4.4).
6. Shoofly Design plans and alignment data.
7. Detailed Construction Phasing Plans.

Four (4) sets of the 60% submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow six (6) weeks for in-house reviews by RFTA.

D. The 100% Submittal shall, at a minimum, include the following:

1. Applicant response to Railroad review comments on the 60% submittal.
2. Revisions to plans and calculations as dictated by review of the 60% submittal.
3. Geotechnical Reports (See Section 3.4.3).

4. Project Specifications and/or Special Provisions, including Railroad coordination requirements.
5. Drainage Report, if drainage is affected (See Section 3.4.4).
6. Shoofly Design plans and alignment data.
7. Detailed Construction Phasing Plans.

Four (4) sets of the 100% submittal shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee. Allow four (4) weeks for review. Final review and resolution of any outstanding issues and upon receipt of four (4) sets of final signed and stamped Construction Documents, RFTA will issue a letter of project acceptance.

3.6 As-Built Submittals

The owner or their representative is required to submit As-Built documents for all Underpass Structures to RFTA at the completion of the bridge structure prior to closing the project. The following is a list of these documents:

Table 3-3, As-Built Submittals

ITEM	As Built	SETS REQD.	NOTES	Format
1	Design Plans and Construction Documents	4	Final plans only	Microstation, .pdf and half size hard copies
2	Shop Plans			
3	Pile driving Records			.pdf and hard copies

CAD and .pdf files shall be submitted on Compact Disc (CD) or flash drive and may also be transmitted electronically via e-mail or through an internet FTP site.

As-Built Submittals shall be transmitted to the RFTA Assistant Director, Project Management & Facilities Operations Director, Project Management & Facilities Operations or his/her designee within eight weeks after completion of the bridge structure.

4. GENERAL REQUIREMENTS FOR GRADE SEPARATION PROJECTS

The recommendations provided within this Section are intended for all Grade Separation Projects impacting the Railroad. All Grade Separation Projects shall be designed in accordance with the requirements in this section and the specific requirements of all applicable sections within these Guidelines.

4.1 RFTA Railroad Operational Requirements

It is essential that the proposed construction be performed without interference to Railroad operations when the rail is operational in the Railroad Corridor.
The most effective method for reducing interference to Railroad operations for construction of Grade

Separation Projects is to use an Overhead Structure and avoid an Underpass Structure. RFTA recommends the use of an Overhead Structure, which can be designed and constructed without interruption to Railroad operations. If an Underpass Structure is required, the project must temporarily reroute train traffic around the construction site by utilizing a shoofly track subject to local operating review and approval. Shoofly track(s) shall be designed per Section 4.1.1.

Construction activities that impact Railroad operations must be coordinated with RFTA. The proposed staging and phasing must be reviewed and approved by RFTA at the concept stage and re-reviewed during the development of detailed plans. Special Provisions must include Railroad coordination to improve Contractor understanding of Railroad requirements prior to letting of the proposed Grade Separation project.

Grade separation structures may require an inside guard rail per Railroad standards.

4.1.1 Shoofly Track(s)

Shoofly track shall be designed for maximum authorized timetable speed for freight and/or passenger trains, per Railroad track standards and operating requirements. Other restrictions specific to the individual Railroad may apply. Applicant needs to verify this with RFTA. The proposed shoofly must be designed to account for track settlement. Construction staging shall be designed to keep RFTA tracks fully operational at all times except for pre-approved construction windows during cutover operations. The Applicant must schedule track related submittals per Table 3-1 or 3-2 for Railroad review and approval.

4.1.2 Track Spacing and Shifting

Existing track spacing will be maintained unless otherwise required by RFTA. Future track shifting and direction of shifting must be verified at the preliminary stage of the feasibility study for the proposed Grade Separation Project. Due to safety and operational needs, existing track spacing may need to be increased to meet current safety standards. RFTA requires a minimum spacing of 20 feet between the centerline of freight tracks and 25 feet between freight and commuter tracks.

4.1.3 Future Track(s)

A fundamental part of any feasibility study is to verify the need, requirement, and location of future main, siding and/ or spur tracks. RFTA has the right to preserve the right-of-way for future expansion per Section 2.2. In many cases, RFTA may have specific plans for additional tracks for all critical, major and other service routes. In other cases, a transit agency may have long-range plans to use part of or the entire corridor for future transit or commuter rail service. Should additional tracks be a possibility, they should be included in the design process. Space is to be provided for one or more future tracks as required for long-range planning or other operating requirements.

Where provisions are made for more than two tracks, space is to be provided for an Access Road on both sides of the tracks.

All structures located within critical, major and other service routes that require additional track(s) shall be designed to accommodate future track expansion. Future freight track shall be located a minimum of 20 feet from the centerline of the nearest existing track. Future commuter track shall be located a minimum of 25 feet from the centerline of nearest existing or future freight track.

4.1.4 Access Road

Access Road requirements and location should be verified at the concept stage of the proposed Grade Separation Project. Access Roads provide maintenance and emergency access to RFTA's local operating units. Access Road, Access Road Bridge or Access Road turnaround with a minimum of 50' radius is to be provided as designated by RFTA. Grade Separation design should include adequate access to existing Railroad facilities along and/or within its right-of-way.

Minimum Access Road width shall be 10 feet and the centerline of the Access Road shall be located a minimum of 20 feet from the centerline of nearest existing or future track.

4.2 Grade Separation Structure Type

RFTA discourages Underpass Structures due to safety concerns, possible interruption to Railroad operations, cost, and limitation of future replacement and maintenance. In general, the least complicated method for a grade separation is to use an Overhead Structure. Economy alone shall not be the governing factor in determining structure type. The analysis of Cost-Benefit ratio shall be fully considered before the structure type is finalized.
The cost-benefit ratio must include all costs associated with interruption to Railroad operations during construction of the proposed structure and/or future replacement structure in addition to future maintenance and other applicable costs.

4.3 Structure Separation

All non-freight Railroad structures, with the exception of Access Road structures running adjacent to existing or proposed Railroad structures, shall be outside RFTA's right-of-way limits or as far away as practical. Clear horizontal separation between structures shall never be less than 25 feet, measured perpendicular to the proposed structure(s) to existing or future Railroad structure(s).

Vertical and horizontal structure separations shall be subject to RFTA's existing, proposed or future structure type, size, location, and other site constraints.

4.4 Construction

RFTA's review and approval of construction submittals defined in Table 3-1 or 3-2 are required. The Applicant and its Contractor are responsible to comply with construction documents approved by RFTA and must execute a work plan that enables the track(s) to remain open to train traffic per Railroad requirements. The Engineer-of-Record and the Applicant shall evaluate the quality of materials furnished and work performed by the Contractor. All field inspection reports, quality control reports and final As-Built plans shall be submitted to RFTA. The project site shall be inspected by RFTA at the Applicant's expense during construction and toward the end of construction for final acceptance before the Contractor demobilizes.

The review of construction submittals and observation of the construction site shall neither relieve the Applicant, Engineer-of-Record nor the Contractor from the ultimate responsibility and liability for the construction on or damages to Railroad property during and after the construction of the project.

4.4.1 Construction Clearances

Temporary horizontal and vertical construction clearances shall be shown on the plans for all Grade Separation Projects impacting RFTA. Every effort must be made to design for greater clearances. Greater clearances may be required for special cases to satisfy local operating conditions such as required sight

distance for signals.
Reduced temporary construction clearances, which are less than construction clearances defined in Section 4.4.1.1 and 4.4.1.2, will require special review and approval by RFTA.

4.4.1.1 Temporary Vertical Construction Clearances

A minimum temporary vertical construction clearance of 21 feet measured above the top of high rail for all tracks shall be provided. The 21-foot temporary vertical clearance shall not be violated due to deflection of formwork. Greater temporary vertical clearances may be required. The temporary vertical clearances are subject to Railroad local operating unit requirements.

4.4.1.2 Temporary Horizontal Construction Clearances

A minimum temporary horizontal construction clearance of 15 feet, measured perpendicular from the centerline of the nearest track, to all physical obstructions including but not limited to formwork, stockpiled materials, parked equipment, bracing or other construction supports, shall be provided.

Temporary horizontal construction clearance shall provide sufficient space for drainage ditches parallel to the standard roadbed section or provide an alternative system that maintains positive drainage.

4.4.2 Shoring

All temporary shoring systems that impact Railroad operations and/or support the Railroad embankment shall be designed and constructed per Railroad Guidelines for Temporary Shoring.

4.4.3 Demolition

All demolition within RFTA's right-of-way, which will impact Railroad tracks or operations, shall comply with Railroad demolition requirements.

4.4.4 Erection

Erection over RFTA's right-of-way shall be designed to cause no interruption to Railroad operations. Erection plans shall be developed such that they enable the track(s) to remain open to train traffic per Railroad requirements.

4.4.5 Falsework

Falsework clearance shall comply with minimum construction clearances per Section 4.4.1. The design of all structural members for falsework shall comply with AREMA as well as Railroad requirements.

4.4.6 Vegetation

Vegetation to be planted on or immediately adjacent to Railroad right-of-way shall not become a fire hazard to track-carrying structures and/or an obstruction to inspection and maintenance of the structures.

4.5 Drainage

Railroad corridors are constructed with a drainage system designed to keep runoff away from the tracks and ballast. The drainage system includes the parallel ditches along the embankments as well as the bridges, culverts, siphons and other structures that convey runoff beneath the tracks or serve as water-

equalizing structures.

Maintaining the integrity of the Railroad drainage system is extremely important. The proposed construction shall safely pass high flows and not inhibit low flows or alter the path of the existing drainage system. When changes in the drainage system are contemplated by new or replacement construction, or because of drainage problems, the system shall be modified as required to accommodate current-condition runoff including any changes that have occurred in the drainage pattern. The size of the proposed drainage system must conform to RFTA's Hydraulic Criteria described in Section 4.5.2 and 4.5.3.

A complete hydrologic and hydraulic study is required whenever new or additional drainage is added to RFTA's right-of-way, or when a drainage structure is scheduled to be added, removed, modified or replaced. The Drainage Report must be in compliance with the requirements described in these Guidelines.

4.5.1 Erosion and Sediment Control

General plans for construction within RFTA's right-of-way shall indicate the proposed methods of erosion and sediment control. They must specifically provide means to prevent sediment accumulation in the ditches and culverts, to prevent fouling the track ballast and sub-ballast, and to allow free flow of runoff in the drainage systems during and after construction.

Corrective and/or mitigative construction due to the fouling of Railroad ballast, sub-ballast, ditches, culverts or drainage systems will be at the Applicant's expense. It is the Applicant's responsibility to document the condition of the site before and after construction.

Existing track ditches shall be maintained open at all times throughout the construction period. After the construction is complete, all erosion and sediment control devices must be removed, all sediment deposits removed, and the entire project area restored to the pre-construction condition.

The Applicant and/or Contractor are responsible for securing the required permits from Local, State and Federal entities. The Applicant and/or Contractor shall furnish RFTA all copies of the Storm Water Pollution Prevention Plan (SWPPP) and approved permits if required. Further, these documents shall be available on-site during all construction activities. Approval of the erosion and sediment control plan does not relieve the Applicant and/or Engineer-of-Record and Contractor of the ultimate responsibility and liability for compliance with erosion and sediment control requirements.

4.5.2 Hydraulic Criteria for Bridge and Culvert Openings

1. Replacement openings shall be sized for two high water events designated "low chord" and "subgrade."
2. Provide the Energy Grade Line (EGL), water surface elevation and velocity flow for both the existing and proposed hydraulic opening.
3. For subdivisions and for any lines in urban areas, regardless of classification, the low chord event is the 50- year flood and the subgrade event is the 100-year flood.
4. For industrial leads and for customer-owned trackage, the low chord event is the 25-year flood and the subgrade event are the 50-year flood unless the proposed structure is immediately adjacent to a mainline bridge(s). Then, the low chord event and subgrade event shall be as stated above in item 3.

5. If the structure is in a FEMA designated floodplain the water surface elevation for a 100-year event shall be determined regardless of line classification.
6. For all cases, the opening will be sized so that the water surface for a "low chord" event will rise no higher than the crown of the culvert or the low chord of the bridge.
7. For all cases, the opening will be sized so that the energy grade line for a subgrade event will not rise above the adjacent subgrade elevation. The subgrade elevation is defined as 2'–3" below the base of rail elevation.
8. Both RFTA criteria and local flood flow criteria shall be evaluated and the more conservative of the two shall be adopted in sizing the replacement.

4.5.3 Hydraulic Criteria for Drainage Systems Parallel to Railroad Tracks

1. Culverts and bridges must be designed in accordance with Railroad standard hydraulic criteria described in Section 4.5.2.
2. The 100-year event criteria (EGL no higher than top of subgrade) is to be applied for parallel ditches, open channels, and encroachments, as well as bridges and culverts. Sufficient lateral and vertical clearance must be provided to accommodate construction of the standard flat- bottom railroad ditch or a ditch based upon the EGL for a 100-year event; whichever produces the larger ditch. Anything less than this standard is an exception and must be supported by hydrology and hydraulics.
3. In cases where RFTA's standard hydraulic criteria is not applicable due to topography of the track bed and surrounding ground, the Railroad standard flat-bottom drainage ditch (trapezoidal, 10 ft bottom width, a minimum of 2:1 side slope, with flowline elevation a minimum of 3 ft below the subgrade elevation) must be incorporated.
4. Where the acquisition of adequate right-of-way is a limiting factor, or site characteristics justify smaller drainage systems, a request for a variance with sufficient supporting documents must be submitted to RFTA for consideration.
5. The applicant must provide hydraulic data (EGL and water surface elevations and velocities) for both existing and proposed conditions.
6. Consideration shall be given to the effects of localized contraction scour and mitigation, and if deemed necessary, shall be shown on the design plans.

4.6 Fences

Chain link fencing with openings not exceeding 2 inches should be used in most applications. In some locations where the trespassers may cut the chain link fence, a wrought iron picket fence with openings not exceeding 3 inches is required. All architectural fencing shall be reviewed and approved by RFTA. Architectural fencing shall not allow an opening of more than 2 inches and shall be designed to prevent climbing.

Right-of-way fencing shall be provided along RFTA's right-of-way to safeguard the general public and prevent trespassers from entering RFTA's right-of-way. Fencing may need to continue outside RFTA's right-of-way limits, which will be at the discretion of RFTA, with the consent of the adjoining owner. These limits shall be reviewed and approved by RFTA. The right-of-way fence shall conform to details as shown on Plan No. 711000, sheet 1.

For overhead grade separation structural fencing, refer to Section 5.4.2.

4.7 Retaining Walls

Retaining walls shall be designed to withstand lateral earth and water pressures, any live load and dead load surcharge, the self-weight of the wall, temperature and shrinkage effects and earthquake loads.

Retaining walls supporting RFTA's embankment shall be designed in accordance with Railroad requirements and the general design principles specified in AREMA.

Retaining walls that do not support Railroad embankment shall be designed in accordance with Railroad requirements and general design principles specified in AASHTO and shall be located outside RFTA's right-of-way limits.

Barrier rail and fencing for the retaining wall are subject to retaining wall location and Railroad operating requirements. Barrier rail and fencing shall be placed in a manner to safeguard the general public while securing the Railroad right-of-way. Barrier rail and fencing shall be designed per Section 5.4.1 and 5.4.2.

4.8 Embankment Surcharge

For all tracks located near a proposed embankment causing the track to be surcharged, the contractor must monitor and record top-of-rail elevations and track alignment. The movement shall be within the limits defined by RFTA. Displacements exceeding the limits must be immediately reported to RFTA. The track shall be adjusted as needed at the expense of the Applicant.

4.9 Utilities

Railroad corridors may have utilities that could impact the design, location or even the feasibility of the proposed Grade Separation Project. During the initial study, the Applicant shall identify existing utilities within RFTA's right-of-way and plan for proper relocation, protection, and installation requirements.

All new or relocated utilities within RFTA's right-of-way will require RFTA prior review and approval. A RFTA Right-of-Entry Agreement (if applicable), per Section 2.3, is required to survey or abandon existing utilities within RFTA's corridor. RFTA has no obligation to provide property for relocated utilities that do not comply with Railroad's standard specifications and requirements including, without limitation, AREMA and these Guidelines.

No utility attachments will be permitted on Underpass Structures. Existing or future fiber optic lines shall be placed underground and away from the bridge structure.

The Applicant shall be responsible for the identification, location, protection, and relocation of all existing overhead and underground utilities. The design plans for the proposed Grade Separation Project shall include complete information on existing and/or proposed relocation of the said utilities.

Appropriate measures for the installation, protection, and relocation of fiber optic cables as well as Railroad signal and communication lines shall be addressed in the plans and contract documents.

In the UPRR freight rail easement area in Glenwood Springs, for Railroad requirements and additional information refer to:

UPRR: www.uprr.com
For UPRR Fiber Optic Engineering, "Call Before You Dig", call 1-800-336- 9193 For UPRR Grade Crossing/Signal Hotline, call 1-800-848-8715

Please refer to UPRR website for utility review and approval process and Application.

In all cases, please coordinate with RFTA and be ready to provide RFTA your UNCC Dig Ticket Number" provided by UNCC and the UP F/O/C Asset Protection Ticket Number if you are in the UPRR Railroad freight Easement north of 19th Street (MP 361.4).

Relocation of utilities or communication lines not owned by RFTA shall be coordinated with the utility owners. The utility relocation plans must then be submitted to the RFTA Assistant Director, Project Management & Facilities Operations or his/her designee for approval.

4.10 Construction Management Team

For the construction of grade-separated structures, an experienced Construction Management Team will be required during the construction of the bridge structure. Public agencies with qualifying bridge structure staff placed on-site during construction will be acceptable; otherwise, an outside team must be obtained. RFTA participation during construction is required as indicated in Section 4.11.

The following are minimum requirements for the Construction Management Team:

- The Applicant is to submit the names and qualifications of the person(s) to be used in the project and their assigned duties.
- Provide a qualified quality control inspector to be present during fabrication of steel spans and any major prestressed concrete items.
- Provide a list of past projects that each person has actively worked on, including bridge structures (highway or rail), underground facilities and drainage structures.
- Provide a verifiable list of employment including a current resume for each person in the Construction Management Team.
- Minimum personnel for the Construction Management Team for a typical grade separation structure will consist of:

    1. Project Manager – Primary point of contact, with experience in managing construction projects, for the Construction Management Team.
    2. Resident Engineer – The resident Engineer for the project shall be a registered Civil Engineer with a minimum of 5 years' experience in the field of bridge construction work.
    3. Construction Engineer – A Construction Engineer performs complex professional engineering work in the management of major construction projects from design through completion.
    4. Construction Inspector – Construction Inspector shall perform a continuous inspection of construction projects for compliance with plans, specifications and contract documents. The inspector shall be familiar with concrete and steel bridge construction and have current certifications in the fields of inspection involved.

- Railroad review and approval of duties, responsibilities, education, and experience for each of the above-listed members of the Construction Management Team will be required.
- All field members of the Construction Management Team are required to have passed and complied with the FRA and Railroad requirements regarding Railroad track safety, bridge fall protection and/or contractor orientation training.

4.11 Railroad Site Observation During Construction

In addition to the official review of submittals, site observation will be performed by RFTA at significant points during construction, including but not limited to the following, if applicable:

Underpass Structure

1. Pre-construction meeting.
2. Shoring systems that impact RFTA's operation and/or support RFTAs embankment.
3. Demolition.
4. Falsework.
5. Erection.
6. Acceptance observation of any shoofly before placing it in service.
7. Foundation installation.
8. Reinforcement and concrete placement for main bridge substructure and/or superstructure.
9. Shop observation of fabricated steel spans and/or any major pre-stressed concrete items either by RFTA or its designated representative.
10. Erection of steel or precast concrete bridge superstructure.
11. Deck installation.
12. Acceptance of waterproofing (prior to placing ballast).
13. Final observation and acceptance of the bridge structure.

Overhead Structure

1. Shoring systems that impact RFTA's operation and/or support RFTAs embankment.
2. Demolition within RFTA's right-of-way.
3. Falsework.
4. Erection over RFTA's right-of-way.
5. Final observation and acceptance of the Overhead Structure.

Site observations are not limited to the milestone events listed above; rather, site visits to check the progress of the work may be performed at any time throughout the construction as deemed necessary by RFTA.

A construction schedule shall be provided to RFTA. Inform the RFTA Assistant Director, Project Management & Facilities Operations or his/her designee of the anticipated dates when the listed events will occur. This schedule shall be updated as necessary, but at least monthly, so that site visits

may be scheduled. Final observation and acceptance of the bridge by RFTA is required before the contractor leaves the job site.

5. OVERHEAD STRUCTURES (Roadway Structure Over Railroad)

The preferred Overhead Structure from the standpoint of RFTA's operation is one that will span the entire Railroad right-of-way. The Overhead Structure shall be designed according to Sections 1, 2, 3, 4 and 5 of these Guidelines, AREMA and any applicable sections of AASHTO. RFTA strongly discourages construction of an Overhead Structure within or in the vicinity of Railroad yard limits.

5.1 Design

The proposed Overhead Structure design plans shall allow the Contractor to execute a work plan that enables the track(s) to remain in service per Railroad requirements.

RFTA discourages the use of cast-in-place superstructures and every effort shall be made to utilize a structure type that will not require an interruption to Railroad operation during construction. Deck drains, future utility installation and expansion or hinge joints for the Overhead Structure over Railroad tracks or inside Railroad right-of-way are not permitted.

5.1.1 Design Plans

Design plans and calculations shall be in accordance with these Guidelines and submitted per Section 3. Compliance with these Guidelines will expedite the review and approval process of submittals for the Grade Separation Project.

5.2 Permanent Clearances

Permanent clearances, as indicated on Plan No. 711100, sheet 1, are minimum clearances. Permanent clearances shall accommodate future tracks, future track raises Access Roads and drainage ditch improvements. Proposed vertical and horizontal clearances shall be adjusted so that the sight distance to any Railroad signals is not reduced unless signals are to be relocated as part of the proposed Grade Separation Project.

The clear zone, within the permanent clearance envelope, shall be clear of all objects such as trees, sign supports, utility poles, and other objects.

Permanent clearance shall be correlated with the methods of construction. This ensures that the temporary construction clearances will not be less than the minimum specified in Section 4.4.1.

5.2.1 Permanent Vertical Clearance

The minimum permanent vertical clearance, per Code of Federal Regulation, shall be 23' - 4" measured from the top of the highest rail to the lowest obstruction under the structure. The 23'- 4" permanent vertical clearance must not be violated due to deflection of the superstructure.

Additional vertical clearance may be required for items beyond those shown in the General Overhead Structure on Plan No. 711100, sheet 1. These items include correction of sag in the track, construction requirements and future track raise.

The profile of the existing top-of-rail measured 1000 feet on each side of the proposed Overhead Structure, shall be shown on the plans. If the profile indicates sag at the proposed bridge location, the vertical clearance from the top of the highest rail to the bridge shall be increased sufficiently to permit raising the track to remove the sag. A note should be added to the profile stating, "The elevation of the existing top-of-rail profile shall be verified before beginning construction." All discrepancies shall be brought to the attention of RFTA prior to the commencement of construction.

5.2.2 Permanent Horizontal Clearance

Future Track per Section 4.1.3 and Access Road per Section 4.1.4, of these Guidelines, must be verified with RFTA in advance of establishing horizontal clearances. RFTA requires all piers and abutments to be located outside RFTA's right-of-way limits and to comply with Section 4.1.3 and 4.1.4 of these Guidelines. If this is not feasible, all piers and abutments shall be located more than 25 feet measured perpendicular from the centerline of nearest existing or future track. Piers within 25 feet, measured perpendicular from the centerline of existing or future track, shall be protected per Section 5.5.2 of these guidelines. Absolute minimum horizontal clearance requiring special review and approval by RFTA, and subject to site conditions, shall be 18 feet measured perpendicular from the centerline of the track to the face of the pier protection wall.

5.3 Temporary Clearances

The proposed Overhead Structure shall be designed to satisfy temporary construction clearance requirements per Section 4.4.1 and shown on the plans in accordance with Figure 1 on Plan No. 711100, sheet 3.

5.4 Overhead Superstructures

The use of cast-in-place beams is not permitted. The use of stay in place deck forms for falsework between precast concrete beams or steel girders is encouraged.

5.4.1 Barrier Rail

Cast-in-place concrete barrier rail without openings and a minimum height of 30 inches shall be provided on both sides of the superstructure to retain and redirect errant vehicles. The barrier rail shall keep the deck's storm runoff from being deposited onto Railroad right-of-way.

Barrier rail for Overhead Structures, which may be subject to snow removal, shall be a minimum of 42 inches in height with a 4-foot wide shoulder, or 30 inches in height with a 6-foot wide shoulder.

Limits of the barrier rail shall extend to the limits of RFTA's right-of-way or a minimum of 25 feet beyond the centerline of the outermost existing track, future track or Access Road, whichever is greater.

The barrier rail shall be detailed in accordance with Plan No. 711100, sheet 4.

5.4.2 Fence with Barrier Rail

Fence with barrier rail shall be provided on both sides of all Overhead Structures crossing Railroad right-of-way. It shall be designed to prevent climbing and provide positive means of protecting RFTA's facility and the safety of Railroad employees below from objects being thrown by pedestrians or passing

motorists.

The limits of the fence with barrier rail shall extend to the limits of RFTA's right-of-way or a minimum of 25 feet beyond the centerline of the outermost existing track, future track or Access Road, whichever is greater. All parallel Overhead Structures that have a gap of 2 feet or more shall be protected with fencing. Structures with a gap of 2 feet or less shall either have the gap covered or be fenced on both sides.

The minimum combined height of a barrier rail with curved fence shall be 8 feet or with a straight fence shall be 10 feet. The barrier rail with fence detail shall be in accordance with Plan No. 711100, sheet 4.

5.5 Overhead Substructures

All piers, abutments, and embankments shall be located outside of RFTA's right-of-way limits. If this is not possible, piers and abutments located within RFTA's right-of-way limits must allow room for future track(s) per Section 4.1.3 and Access Road per Section 4.1.4.

Footings for all substructures shall be located and designed to allow a minimum of 12 feet temporary horizontal construction clearance measured at a right angle from the centerline of the nearest track to the face of shoring to facilitate footing construction. Temporary shoring shall be designed per Section 4.4.2.

Drilled shafts within the influence of track surcharge shall be designed and constructed with a casing to protect the track against cave-in, subsidence and/or displacement of the surrounding ground.
The casing shall be designed for live loads due to the Railroad design surcharge in addition to all other applicable loads. Drilled shafts shall be designed to allow the drilling operation without impacting Railroad operations.

5.5.1 Piers

Every effort shall be made to place piers outside RFTA's right-of-way or a minimum of 25 feet measured perpendicular from the centerline of existing or future track to the face of the pier.

Piers within 25 feet of the nearest existing or anticipated future track shall be of heavy construction or shall be protected by a pier protection wall. Refer to Section 5.5.2 for heavy construction requirements.

A Pier footing within 25 feet of the nearest existing or future track shall be a minimum of 6 feet below the base of the rail. This will allow RFTA to modify their longitudinal drainage system in the future and/or provide an unobstructed area for placing signal, fiber optic or other utilities.

For piers with 25 feet of clearance from centerline of nearest existing track and located within RFTA's right-of-way, RFTA requires language in the proposed Agreement mandating the Applicant to fund the construction of pier protection walls on the bridge piers should they ever be required due to additional trackage being constructed by RFTA or for any other legitimate reason. The Applicant shall also be responsible for modification to the pier protection wall if deemed necessary by RFTA in the future.

Inside guardrail shall be required, between rails, for all piers located within 25 feet from the nearest existing or future track

5.5.2 Pier Protection

The pier protection wall shall be designed to resist the impact and redirect equipment in case of derailment. Both sides of the pier shall be protected in locations where tracks are within 25 feet on both sides of the pier.

If seismic criteria are considered, pier design may require column isolation with the wall supported on an independent footing.

All replacement or modified structures shall comply with AREMA requirements for pier protection walls.

In locations where pier columns and protection walls interfere with drainage, an alternative drainage facility shall be provided to collect and carry water to a drainage system.

AREMA defines a pier of heavy construction as: "Cross-sectional area equal to or greater than that required for the pier protection wall and the larger of its dimensions is parallel to the track". For a single column the minimum cross-sectional area is 30 sq. ft. (12' length x 2.5' width = 30 sq. ft.). Columns with 30 square feet of cross-sectional area must have the larger dimension parallel to the track; for example, a 5' x 6' column with the 6' dimension parallel to the track is considered as heavy construction.

The Pier Protection detail shall be in accordance with Plan No. 711100, sheet 6.

5.5.3 Abutments

All abutment slopes, mechanically stabilized earth walls and abutment structures shall be located outside Railroad right-of-way.

Slope layout shall provide for the minimum drainage ditch (es) or culverts required by hydraulic studies in the area; see Plan No. 711100, sheets 1 and 5 for details. The toe of the slope shall terminate at the bottom of the drainage ditch and must have a cut-off wall as required to protect the slope from erosion. In all cases, the toe of slope shall be below the finished track or roadway subgrade.

Top of paved slopes shall extend a minimum of two (2) feet past the abutment wall face, and terminate with either a curb or gutter to divert runoff. Paving shall have a prepared sub-base and filter fabric. Reinforced concrete or grouted rip-rap, with a minimum thickness of 4 inches, shall be placed on prepared sub-base and filter fabric.

5.6 Lighting

All lighting shall meet local jurisdiction code in areas outside of the operating railroad right of way and the UPRR easement area in Glenwood Springs. For any portion of RFTA’s right of way with existing rail operations, the following standards apply:

All new or modified Overhead Structures exceeding 80 feet in width shall provide a lighting system to illuminate the track area. However, subject to RFTA and local jurisdiction approval, lighting shall be provided for all structures less than eighty (80) feet in width in areas where switching is performed or where high vandalism and/or trespassing have been experienced. Care shall be taken in lighting placement such that trains will not mistake the lights for train signals nor shall they interfere with the train engineer's sight distance for existing signal aspects. All lights shall be directed downward.

Provide temporary lighting for all falsework and shoring areas.

The minimum lighting design criteria shall be an average of one (1) foot-candle per square foot of structure at the Railroad tracks. Use Holophane module 600 under decking type luminaries or equal as required. Fixtures shall be installed on the column walls or caps of the Overhead Structure without reducing the minimum horizontal and vertical clearances.

Maintenance of lights shall be the responsibility of the Applicant. Access to perform any maintenance for lights shall be coordinated with the local Railroad operating unit.

Structures with separation over ten (10) ft. from each other shall be considered as independent structures for the purposes of lighting.

5.7 Drainage and Erosion

Drainage from Overhead Structures shall be diverted away from RFTA's right-of-way at all times. Scuppers from the deck shall not be permitted to discharge runoff onto the track or Access Road areas at any time. If drainage of the deck uses downspouts in the columns they shall be connected to the storm drain system or allowed to drain into drainage ditches. Concrete splash blocks or aggregate ditch lining will be required at the discharge area of downspouts. Downspouts shall be behind the face of all piers.

If the layout of abutments, piers or columns with protection walls interferes with the drainage ditches, the designer shall provide an alternative method of handling the longitudinal drainage based on a hydraulic study. This may consist of pipe culverts.

Track drainage ditch limits shall be shown to scale on the project plans and show the distance from the centerline of the nearest track. A typical cross-section detail shall be shown on the plans.

If the proposed bridge structure will not change the quantity and characteristics of the flow in Railroad ditches and drainage structures, the plans shall include a general note stating so.

Lateral clearances must provide sufficient space for construction of the required standard ditches parallel to the standard roadbed section. Should the proposed construction change the quantity and/or characteristics of flow in the existing ditches, the ditches shall be modified as required to handle the increased runoff. The size of ditches will vary depending upon the flow and terrain and should be designed accordingly.

All drainage systems shall be in compliance with Section 4.5.2 and 4.5.3 and Erosion and Sediment Controls shall be in compliance with Section 4.5.1.

6. UNDERPASS STRUCTURES (Railroad Structure Over Roadway)

The most desirable Grade Separation Structure from the standpoint of RFTA is an Overhead Structure. The Applicant shall justify the use of an Underpass Structure in detail. The Underpass Structure shall be designed according to Sections 1, 2, 3, 4 and 6 of these Guidelines, the current edition of AREMA and any applicable sections of AASHTO.

6.1 Design

The proposed Underpass Structure design plans shall allow the Contractor to execute a work plan that enables the track(s) to remain in service per Railroad requirements. The proposed structure shall be designed so there is no interruption to RFTA's operation during construction.

RFTA discourages the use of structures that are not listed in Section 6.8.1 as an acceptable superstructure type. The use of Railroad standard spans where possible is encouraged. Only simple spans with ballast decks are allowed. Cast-in-place concrete superstructures are unacceptable.

6.1.1 Design Loads

The proposed Underpass Structure shall be designed for the following loads:

- Live load and Impact as specified in AREMA. For multiple track structures, the live load shall be calculated based on the assumption that the track(s) can be located anywhere on the bridge with the horizontal clearance to the handrail defined in Section 6.6.1, and a maximum track spacing of 13 feet. For actual track, spacing refers to Sections 4.1.2 and 4.1.3.
- Dead load shall include up to 30 inches of ballast from top of the deck to the top of the tie and all other applicable dead loads.
- Seismic design shall comply with the criteria of the current edition of AREMA, Chapter 9 - Seismic Design for Railway Structures.
- Additional loads shall be applied as specified in Chapters 8, 9, and 15 of AREMA, as applicable.

6.1.2 Design Plans and Calculations

Design plans and calculations shall be in accordance with these Guidelines and submitted per Section 3. Compliance with these Guidelines will expedite the review and approval process of submittals for the Grade Separation Project.

6.1.3 Concrete Requirements

All concrete material, placement, and workmanship shall be in accordance with Chapter 8 of the current edition of AREMA and the following:

1. Minimum Compressive Strength – 4000 lb. per square inch at 28 days.
2. Exposed surfaces shall be formed in a manner that will produce a smooth and uniform appearance without rubbing or plastering. Exposed edges of 90 degrees or less are to be chamfered ¾" x ¾". Top surface to have a smooth finish, free of all float or trowel marks with the exception that a broom finish is used on all walkway surfaces.
3. Concrete shall be proportioned such that the water-cementitious material ratio (by weight) does not exceed the values in AREMA Table 8-1-9. Precast concrete must contain a minimum of 610 pounds of cementitious material per cubic yard of concrete. Cast-in-place concrete must contain a minimum of 565 pounds of cementitious material per cubic yard of concrete. If fly ash is used with cement it shall be limited to 15% of the cementitious material.
4. Cement shall be Type I, II or III Portland Cement per ASTM C150.

5. Coarse aggregate shall be size no. 67.
6. Fine aggregate shall be natural sand.
7. Admixtures, other than air entrainment, shall not be used without approval by RFTA.
8. Membrane curing compound shall conform to ASTM C309 Type 2.
9. Apply ThoRoc Epoxy Adhesive 24LPL or approved alternate before placing new concrete against hardened surfaces.
10. For precast elements, the fabricator shall stencil the fabricator's name, date of fabrication, the bridge number, lifting weight and piece mark on each component.
11. The production facility must be pre-certified. Production procedures for the manufacture of precast members shall be in accordance with AREMA and the current edition of the Precast Concrete Institute's Manual MNL 116 for Quality Control.
12. Dimensional tolerances governing the manufacture of precast members shall conform to Division VI, Section 6.4.6 of the Precast Concrete Institute's Manual MNL 116 for Quality Control. Tolerance for the location of lifting devices shall be ½".
13. The area around all lifting loops shall be recessed so that the loops can be removed to a depth of ¾" and grouted. Properly designed lift anchors are acceptable in lieu of lifting loops.
14. The fabricator will be responsible for the loading and properly securing the precast concrete members for shipment. All concrete components shall be made available, at RFTA's discretion, for inspection by the Engineer-of-Record and RFTA at the fabricator's plant prior to shipment.
15. Foam used to create internal voids in a precast concrete member, such as in box beams, shall be securely tied down to prevent displacement during concrete placement.

6.1.4 Reinforcing Steel Requirements

1. Reinforcing Steel shall be deformed, new billet bars per current ASTM A615 Specifications and meet Grade 60 requirements.
2. Reinforcing Steel requiring field welding or bending shall conform to ASTM A706 Specifications, Grade 60.
3. Fabrication of reinforcing steel shall be per Chapter 7 of the CRSI Manual of Standard Practice. Dimensions of bending details shall be out to out of bars.
4. Reinforcing steel is to be blocked to the proper location and securely wired against displacement. Tack welding of reinforcing is prohibited. Minimum concrete cover not otherwise noted shall meet current AREMA requirements.

6.1.5 Prestressing Strand Requirements

1. Prestressing strand shall be seven wire, uncoated and low relaxation which is in accordance with the requirements specified in ASTM A416, ACI 318 and AREMA Chapter 8.
2. The strand shall have an ultimate tensile strength of 270 ksi.

6.1.6 Structural Steel Requirements

1. All major elements subjected to railroad live load shall conform to the following minimum specifications, except as otherwise noted:
   a. Painted structures: ASTM A709 Grade 50,
   b. Unpainted structures: ASTM A709 Grade 50W.

2. All bolted connections shall be made with high strength bolts.
3. Material over 4 inches in thickness that is subject to railroad live load shall conform to the following specifications:

   a. Painted structures: ASTM A572 or ASTM A588.
   b. Unpainted structures: ASTM A588.
4. Elements not subjected to direct railroad live load (intermediate stiffeners, lateral bracing, diaphragms, ballast curbs, etc.) shall conform to the following specifications:
   a. Painted structures: ASTM A572 Grade 50, ASTM A36 or ASTM A992.
   b. Unpainted structures: ASTM A588.
5. Steel bridge deck shall conform to A709 specifications, Grade 36.
6. Deck cover plates and closure plates may be per ASTM A36 specifications.
7. Anchor rods/bolts shall conform to ASTM F1554 specifications.
8. End welded studs shall be C1015, C1017 or C1020 cold drawn steel, which conforms to ASTM A108 specifications.
9. Cover plate, closure plates, and anchor rods/bolts shall be galvanized after fabrication in accordance with ASTM A123, thickness Grade 100.
10. Anchor rod washers shall be zinc coated in accordance with ASTM A153 specifications.

6.2 Future Track and Access Road

It is required to verify the need and requirements for future tracks and/or Access Road for each project. Future track shall be in accordance with Section 4.1.3. Access Roads shall be in accordance with Section 4.1.4 and 6.2.1.

6.2.1 Access to Underpass Structure

For all Underpass grade separation structures, access to each end of the bridge shall be provided for Railroad off-track maintenance equipment. Access may consist of a road on the bridge, a road on a separated bridge or a roadway with turnarounds.

If the bridge maintenance Access Road is part of the main railway structure, the structure shall be designed for Cooper E-80 live load to accommodate any future track needs or modifications. A removable concrete barrier shall be provided to separate the nearest track from the Access Road by retaining the ballast. If the bridge maintenance access is a completely separate structure it shall be designed for AASHTO HS25-44 live load. The Access Road shall accommodate one 12-foot-wide lane

with curbs and railing.

If a bridge maintenance structure is not provided, an Access Road with a turnaround shall be designed and constructed in conjunction with the grade separation bridge structure. The turnaround pad shall start no further than 30 feet from the end of the bridge structure with the embankment shoulder a minimum of 60 feet from the centerline of the track. The radius for the turnaround shall be a minimum of 50 feet. Roadway grade shall not exceed 10% and shall terminate at the sub-ballast elevation. The roadway shall have sufficient width to provide for one 12-foot-wide road, drainage ditch, and shoulder. The turnaround pad and roadway shall be sloped to drain away from the track and carry the water to a drainage system or existing Railroad right-of-way ditches.

Access Road with a bridge maintenance structure or turnaround shall be shown in the 30% submittal and the complete design shall be included in all subsequent submittals.

6.3 Skew

The preferred angle of intersection between the centerline of track and the centerline of bridge supports, transverse to the track, is 90 degrees. The minimum angle that will be allowed between the centerline of the track and the centerline of bridge supports, transverse to the track, is 75 degrees for a Concrete Superstructure and 60 degrees for a Steel Superstructure.

Align bridge piers and abutments as required to comply with the above maximum skew limitations. Tie rods, diaphragms and approach slabs shall be designed per Section 6.8.10.1, 6.8.8.1 and 6.4, respectively.

Where conditions preclude compliance with these skew requirements, the skew proposal will require special structural consideration and proof of adequacy.

6.4 Approach Slab

On skewed abutments, an approach slab is required. The bridge end of the approach slab shall be skewed and doweled with the abutment while the other end of the approach slab is perpendicular to the centerline of the track to ensure uniform subgrade stiffness for the ties immediately adjacent to the bridge. The approach slab shall be constructed symmetrically to the centerline of the track and shall be a minimum of 12 feet wide and extend parallel to the track a minimum of 3 feet beyond the back edge of the abutment.

6.5 Structure Separation

Horizontal separation between Railroad structures or Railroad and Access Road structures shall be minimum of 5 feet clear. All other structure separations shall be in accordance with Section 4.3.

6.6 Clearances

Permanent clearances shall be correlated with the methods of construction to ensure compliance with the temporary clearances specified in Section 4.4.1.

6.6.1 Permanent Vertical Clearance

Underpass Structures shall be designed to ensure that the structure will be protected from oversized or unauthorized loads by providing sufficient vertical clearance and protective devices unless otherwise specified by RFTA.

Provide a minimum vertical clearance over the entire roadway width for all new or reconstructed structures as follows:

- 16’-6” for steel superstructure with 5 or more beams or 4 or more deck plate girders per track.
- 17’-6” for concrete superstructure or steel through plate girders with bolted bottom flanges.
- 20’-0” for steel through plate girders without bolted bottom flanges.

The vertical clearance must not be violated due to the deflection of the superstructure.

Variations from vertical clearance defined above shall be submitted to RFTA for approval. The variance will be considered if the Railroad structure is not the lowest structure within the roadway network. All proposed structures with substandard vertical clearances shall be designed per Section 6.7.

If resurfacing or any other activity is to be performed below the Underpass Structure, the owner of the roadway must submit a request for approval from RFTA. This request must provide the existing measured and posted clearances of the structure and the proposed configuration after work is completed.

The owner of the roadway shall be responsible for graffiti removal and for posting and maintaining the clearances and any advance notifications the roadway requires. No sign shall be attached to a Railroad bridge.

6.6.2 Permanent Horizontal Clearance

The horizontal clearances from the centerline of the nearest track to any bridge component shall, in all cases, conform to AREMA requirements except that in curved track the minimum increase in clearance shall be 6 inches. Proposed structures that accommodate multiple tracks, future tracks and existing tracks having a spacing of fewer than 20 feet, shall be designed for a minimum of 20-foot spacing measured centerline to centerline.

6.6.3 Temporary Clearances

The proposed Underpass Structure shall be designed to satisfy temporary construction clearance requirements per Section 4.4.1, which shall be shown on the plans in accordance with Figure 1 on Plan No. 711100, sheet 3.

6.7 Sacrificial Beams, Fascia Beams and Impact Protection Devices

All structures with vertical clearances less than defined in Section 6.6.1 shall be protected with a sacrificial beam. Access to the sacrificial beam shall be blocked on both ends and the sacrificial beam shall be located to safeguard the bridge from oncoming vehicles.

Sacrificial beams shall be steel shapes (wide flange or hollow structural sections) and of sufficient strength to limit horizontal deflection, caused by the impact from oversized vehicles or loads, to 6 inches. The sacrificial beams shall also be securely anchored with cables at each end to prevent them from falling, and its soffit shall be at least 2 inches below the bridge soffit.

Concrete fascia beams used as walkways shall be installed adjacent to the proposed structure and may also serve as a sacrificial beam. If a concrete fascia beam is used as a sacrificial beam it shall have a 6" x 6" x 1" embedded steel angle facing oncoming traffic and shall be adequately anchored to the bridge seats at an elevation at least 2 inches below the bridge soffit.

All concrete spans, where sacrificial beams are not required, shall be protected with impact protection devices installed over the full width of traveled lanes and attached to the bridge soffit. See Plan No. 711200, sheet 13.

6.8 Superstructure

The size of the superstructure must accommodate future track(s) per Section 4.1.3 and Access Road per Section 4.1.4. For typical cross sections of superstructures see Plan No. 711200, sheets 2 through 9.

6.8.1 Acceptable Superstructure Types

The following is a list of Underpass Structure types that are acceptable to RFTA and listed in the order of preference. RFTA's preferred superstructure type is the highest listed feasible alternative unless a detailed type selection report provides justifications that a lower listed alternative is more beneficial to RFTA and to the project.

1. Rolled Beams with Steel Plate Deck. There shall be at least five beams per track.
2. Steel Plate Girders with Steel Plate Deck. There shall be at least four girders per track.
3. Rolled Beams with Concrete Deck. There shall be at least five beams per track.
4. Steel Plate Girders with Concrete Deck. There shall be at least four girders per track.
5. Railroad Standard Prestressed Precast Concrete Double Cell Box Beams.
6. Prestressed Precast Concrete Box Beams, a single or double cell for a span of 50 feet or less.
7. Prestressed Precast Concrete AASHTO Type Beams, (or similar) with Concrete Deck for spans of 50 feet or less.
8. Steel Through Plate Girders with Steel Plate Deck will be considered by RFTA when conditions preclude any other structure type.

Underpass Structures of deck truss or through truss design are discouraged. However, in unusual circumstances, they will be considered by RFTA if conditions preclude the use of any other type of structure.

6.8.2 Deck Type and Width

In all cases, when using a steel superstructure the use of a steel deck is preferred. The deck width shall be a function of the future track, Access Road, existing track(s), minimum horizontal clearance per Section 6.6.2 and a minimum of 20-foot spacing between centerlines of tracks.

6.8.3 Composite Deck

Under normal working loads, the composite action may be expected between a concrete deck and it's supporting girder steel members when shear transfer devices are used. The bottom of the deck slab shall be placed at least one inch below the top of supporting steel members. For design purposes, the supporting girders shall be designed to satisfy deflection criteria and carry E65 live, impact and dead loads without utilizing any composite action, and E80 live, impact, and dead loads utilizing composite action. Composite action may be mobilized to satisfy the deflection-length ratio requirement of Chapter 15, Article 1.2.5 of AREMA, provided shear transfer devices are installed. Steel decks may be utilized in composite action to satisfy the deflection-length ratio requirement. However, the composite action shall not be assumed to satisfy strength requirements.

6.8.4 Ballast Retainers, Fences and Handrails

Ballast retainers must be designed to prevent ballast from falling on the roadway. Handrails with fencing shall be provided on both sides of the deck and shall meet FRA and OSHA requirements. Handrails and fences shall be simple designs that require minimum maintenance and shall meet clearance requirements of Section 6.6.1. Fences are required overall roadways, trails and sidewalk areas.

The top of ballast retainer shall be minimum of 30 inches above the top of the deck if fascia beam is used in accordance with typical sections shown in Appendix A. If fascia beam is not used, top of ballast retainer shall be 36 inches above the top of the deck.

6.8.5 Walkway

Walkways on bridges, over highways or other locations where spillage of ballast or lading is possible, shall be constructed of a solid material and a curb or toeboard shall be provided. In accordance with Section 6.6.1, the clear distance from the centerline of the track to the ballast retainer for bridges without a walkway shall be a minimum of 8’-0”. To prevent cracking under live loads, provide 1/4-inch-wide control joints at less than 10 foot spacing on concrete curbs, walkways and ballast retainers.

Ballast section may be used as a walkway, at the discretion of RFTA, provided the permanent horizontal clearances are in accordance with Section 6.6.2. If a solid walkway surface is required, it shall be a minimum of 2’- 6” wide and be provided on both sides of the structure.

6.8.6 Drainage

A minimum longitudinal grade of 0.2% on the superstructure shall be provided to ensure adequate drainage. The designer may provide drainage toward one end of the structure, or when the structure's length is excessive, provide adequate deck grades to drain the structure to both ends. If the top-of-rail grade is less than 0.2% over the length of the structure then the depth of ballast may be varied along the structure.

The top of the concrete deck shall be sloped a minimum of 0.5% transversely.

For concrete decks, a longitudinal collection system shall be provided on top of the waterproofing along the face of parapet or curb to drain water. Longitudinal drains shall be connected to the storm drain system or properly discharged at the toe of embankment slopes. See Plan No. 711200, sheet 10.

If an approach grade descends toward the bridge, drainage from the approach shall be intercepted by an appropriate system so that it will not drain onto the bridge.

Inadequate drainage facilities can severely limit the lifespan of the superstructure. When designing drainage facilities for a structure two important criteria to keep in mind are:

1. Drains should be constructed of corrosion resistant material and the use of PVC shall not be permitted.
2. Drains should not discharge on other bridge elements or traffic passing underneath the structure.

The drip groove located on the bottom of the deck slab or fascia beam shall end 3 feet before the face of the abutment.

6.8.7 Waterproofing

Waterproofing and protective panels shall comply with the recommendations of Chapter 8, Part 29 of AREMA. The waterproofing shall be one layer of Butyl Rubber or EPDM membrane and shall be bonded to the entire bridge deck surface with adhesive applied in accordance with the recommendations of the membrane manufacturer. A Butyl Rubber or EPDM membrane shall be 0.06 inches thick, minimum. Field splices shall be the tongue and groove type per AREMA Chapter 8, Part 29, Detail No.3, Figure 8-29-3. Protective asphalt panels shall be placed in two layers with a total thickness not less than 1 inch and shall be laid with joints staggered. Protective panels shall be bonded to the membrane and each other. For waterproofing, details see Plan No. 711200, sheet 11.

Alternatively, a cold liquid spray-on waterproofing meeting AREMA requirements, with a single ½ inch layer of protective asphalt panels, may be acceptable to RFTA.

Six inches of ballast shall be placed over waterproofing immediately upon acceptance by RFTA. No construction traffic is allowed on waterproofing until the ballast covering is in place. Waterproofing installation shall be observed and approved by the manufacturer's representative.

6.8.8 Steel Superstructure

The thickness of structural steel, except for fillers, shall not be less than 3/8 inch. Steel, subject to corrosive influences, shall be of greater thickness than otherwise specified to protect them against deterioration.

The thickness of gusset plates connecting the chords and web members of a truss shall be proportional to the force being transferred but not less than 1/2 inch.

The minimum diameter of high strength bolts shall be 7/8-inch diameter. Floor beams shall be a minimum of 21 inches in depth.

The allowable bearing pressures as recommended in AREMA Chapter 15 shall be used for steel superstructures bearing on concrete substructures.

All fracture critical members as defined by AREMA shall be designated as FCM on the plans. Fracture critical members shall be designed for a minimum service temperature and Charpy V-Notch Toughness as required for the corresponding zone.

The Designer shall provide details such that all exposed parts will be accessible for inspection, cleaning and painting. Not less than 18 inches of clearance shall be provided between the flanges of parallel lines of beams or girders having depths in excess of 38 inches.

All designs must provide drain holes for pockets or depressions that may hold water so that steel areas drain effectively. Structural members shall not be sealed by welding except as approved by RFTA.

In built-up steel girders, provide at least 2 feet between the web and the flange shop-welded splices.

6.8.8.1 Diaphragms or Cross Frames

Diaphragms or Cross Frames shall be provided for all steel spans. Jacking stiffeners or jacking beams are required for all steel structures.

6.8.8.2 Mechanically-Connected: Bottom Flanges and Intermediate Stiffeners

Girders shall have mechanically-connected bottom flanges and intermediate stiffeners when:

- The girder span is over a roadway and the use of two girders per span or track cannot be avoided (such as a through plate girder).
- 20 feet of vertical clearance cannot be provided.

Cover plates, flange elements, and intermediate stiffeners shall comply with the following requirements.

1. Cover plates of girders with bolted flanges shall be equal in thickness or shall diminish outwardly in thickness. No plate shall be thicker than the flange angles. The gross area of cover plates in any flange shall not exceed 70 percent of the total flange. The total flange consists of cover plates, flange angles directly connected to the cover plates and side plates. The area of any flange element (flange angle, cover plate or side plate) shall not exceed 50 percent of the total

flange.

2. Flange elements that are spliced shall be covered by extra material equal in section to the element spliced. There shall be enough bolts on each side of the splice to transmit to the splice material the stress value of the part cut. Flange angles may be spliced with angles or with a full penetration weld. No two elements shall be spliced at the same cross-section or within the development length of another spliced element. Welded splices will not be allowed in plate elements of bolted flanges.
3. All intermediate stiffeners shall have a bolted connection to the web.

6.8.9 Painting of Steel Structures

Painting of steel structures shall comply with the current requirements of AREMA, AASHTO specifications and recommendations of the Steel Structures Painting Council (SSPC).

Paint shall be applied in accordance with the Manufacturer's recommendations or as recommended by the SSPC, whichever is most restrictive.

The painting system, including primer and top coats, shall be submitted by the Applicant for review and approval by RFTA and must be maintained by the Applicant.

6.8.10 Concrete Superstructure

Live load distribution for precast prestressed concrete single or double cell box beams shall be in accordance with Chapter 8, Part 2, Reinforced Concrete Design, and Article 2.2.3.c of AREMA. This means that it shall not be assumed that the live load is necessarily equally distributed to the number of boxes supporting the tracks.

Box shaped (Single or Double void) or AASHTO type precast prestressed concrete beams for all spans shall be designed with an end and interior diaphragms. Interior diaphragms shall be spaced equally across the span length.

Strands at the ends of precast prestressed concrete members shall be recessed a minimum of 1 inch into the member and the pocket filled with grout.

For AASHTO type beams, the designer shall provide a minimum of eighteen (18) inches clear between the bottom flanges to accommodate inspection and repair.

6.8.10.1 Tie Rods

Transverse tie rods shall be provided for all concrete spans utilizing single cell box beams. Transverse tie rods shall be used at span ends and intermediately spaced at maximum intervals of 25 feet. Wherever possible, transverse tie rods in end and interior diaphragms shall be placed perpendicular to the centerline of webs to facilitate application of transverse post-tensioning.

The minimum size of tie rod shall be 1-1/4 inches in diameter. Tie Rods shall be threaded steel bars with a minimum fy = 36 ksi. Tie rods shall be tensioned as necessary to ensure that all beam sides are in contact without causing any vertical displacement of the beams from the bearings. The tie rod shall

be protected in one of the following ways:

1. Rod, plates, and nuts shall be hot dip galvanized per ASTM A123 and A153 specifications.
2. All assembly parts left plain but void between rod and hole to be pressure grouted. The tie rod anchor assembly shall be recessed into the concrete and shall have 1-inch minimum grout cover.

6.9 Substructure

Pier and or abutment dimensions must accommodate future track(s) and Access Road per Section 4.1.3 and 4.1.4.

Footings for all substructures shall be located and designed to allow a minimum of 12 feet measured perpendicular from the centerline of the nearest active track to face of shoring to facilitate footing construction. Temporary shoring shall be designed per Section 4.4.2.

Cross-hole Sonic Log (CSL) Testing may be required by RFTA to evaluate the integrity of drilled shafts/caissons. The Plans and Specifications shall include provisions for this testing.

Drilled shafts within the influence of track surcharge shall be designed with the temporary casing for protection against cave-in, subsidence and or displacement of surrounding ground. Casing shall be designed for live load due to the Railroad design surcharge in addition to all other applicable loads. Drilled shafts shall be designed to allow the drilling operation to proceed without impacting RFTA's operation.

6.9.1 Piers

Columns shall be at least 0.2H in thickness at the base. Slope the top of bridge seat to drain. If weathering steel is used for the superstructure, detail the bridge seat to minimize water staining concrete surfaces.

Provide a minimum edge distance of 6 inches from the edge of masonry plate or bearing to edge of the concrete.

Provide a minimum of 18 inches beyond the outside edge of outermost masonry plate or bearing to end of the pier.

Single column piers shall not be considered for Underpass Structures. Piers with a minimum of two columns shall be provided. A solid pier wall with a minimum of 4 feet thickness is preferable.

Bridge piers adjacent to roadways shall be protected from vehicular traffic as required per AASHTO and State Department of Transportation standards.

6.9.2 Abutments

Slope the top of bridge seat to drain. If weathering steel is used for the superstructure, detail the bridge seat to minimize water staining concrete surfaces.

The abutments shall be wide enough to satisfy the Railroad standard roadbed. For multiple track bridges, the abutment width shall be sufficient to provide for the standard shoulder, plus 20 feet for each existing or future track.

Provide a minimum edge distance of 6 inches from the edge of masonry plate or bearing to the edge of the concrete. Sloping embankments in front of abutments shall be paved or have grouted rip-rap on top of filter fabric.

The year of construction shall be shown at the face of the abutment back wall. Numbers shall be embedded into the concrete and be 6 inches size and located where visible.

Wing walls shall be designed to support 2:1 embankment slopes and provide positive ballast containment.

6.10 Sequence of Construction

It is essential that the construction proceeds with no interference to Railroad operations. Continuity of safe rail operation will be required for the duration of the project. The Applicant should contact RFTA in the preliminary design stages to determine RFTA's operation requirements.

The most effective method for maintaining traffic is to temporarily reroute Railroad traffic around the construction site using detour tracks (shoofly). Shooflies shall be designed per Section 4.1.1.

The use of shoofly for the construction of the permanent structures will minimize traffic interference with railroad operations. However, if construction requires interruption of rail traffic or track and time windows, approval from RFTA is required. No design shall advance without written approval. Prior to the start of any construction on the Railroad right-of-way, a RFTA Right-of-Entry Agreement (if applicable) is required per Section 2.3.

6.11 Construction Excavation

Excavations for construction of footings, piers, columns, walls and other facilities that require shoring to support active tracks shall comply with RFTA/UPRR Temporary Shoring Guidelines

6.12 Temporary Structures

Temporary railroad bridges used for a shoofly must be designed in accordance with AREMA and these Guidelines. Temporary open deck bridges with walkways may be used if a protective cover over the roadway and sidewalks is provided or if the roadway is closed to traffic during construction.

7. TRAILS (Non-Vehicular Crossing over or under the Railroad)

All Trails impacting RFTA shall be designed in accordance with Section **1, 2, 3, 4 & 7** of these Guidelines, the Manual of Uniform Traffic Control Devices (MUTCD), AASHTO code and any applicable sections of AREMA.

7.1 At Grade Crossing

When railroad operations are inactive in the Railroad Corridor, RFTA will allow at-grade Trail crossings. When the rail is active in the railroad corridor alternative plans may be necessary to avoid conflicts with trains and/or automobiles. At grade crossings immediately adjacent to an existing public roadway crossing with existing Highway Railroad warning devices may be considered.

However, all costs associated with the installation of the new crossing surface and crossing warning device changes or relocation will be borne by the Applicant. Scope of the proposed crossing work will be determined at a joint-diagnostic meeting between RFTA and Applicant. The Trail must conform to Railroad and MUTCD requirements.

7.2 Trail Parallel to Track

With the exception of RFTA's planned final recreational trail, when railroad operations are active in the Railroad Corridor, RFTA generally will not allow Trails parallel to the track on Railroad right-of-way and will not permit the use of Railroad Access Roads for trail use. Railroad bridges cannot be used to serve Trail traffic or support a structure serving Trail traffic. Fences or barriers such as vegetation, ditches, and/or berms shall separate Trails that are outside RFTA's right-of-way and running parallel to the track to stop trespassers from entering RFTA's right-of-way. See Plan No. 711000, sheet 2.

7.3 Grade Separated Crossing

Consider the use of existing structures to cross RFTA's tracks. In accordance with Homeland Security requirements, some Railroad sites and structures are off limits for Trail use and crossing.

7.3.1 Overhead Crossing (Trail over Railroad)

New and existing Overhead Structures must be designed or modified with a protective curved fence. See Plan No. 711100, sheet 4. New Overhead Structures shall be designed per Section 5 of these Guidelines.

7.3.2 Underpass Crossing (Railroad Structure over Trail)

RFTA discourages the construction of new Underpass Structures. If an Underpass Structure is the only feasible structure type for the proposed site, a detailed type selection report must be

submitted to justify its use.

7.3.2.1 New Underpass Crossing

New Underpass Structures shall be designed per Section 6 of these Guidelines.
All pipe and concrete box culverts shall be designed per Railroad requirements and any applicable sections of AREMA. Confined structures are discouraged. To improve safety and sight distance all structures shall be tangent without curvature. The clear width and height of pedestrian structures shall be subject to the project site and structure length. The line of sight, historical security data and lighting shall be used for determining the required size of the opening. Vertical Clearance shall not be less than 8 feet.

7.3.2.2 Crossing Under Existing Structures

An open deck structure shall be modified to a ballast deck or solid deck structure to maintain a safe crossing under a Railroad structure. If modifying an existing open deck structure is not practical, provide a protective cover over the Trail.

Protection from falling debris is required for the crossing of pedestrians safely under active rail bridges. The overhead protection shall extend a minimum of 30 feet out on each side of the Railroad structure, or further as designated RFTA. However, the protective cover shall not reduce the existing hydraulic opening, shall not function as a debris catcher and shall not impact proper inspection of the structure by Railroad personnel.

Measuring the from the bottom of the Railroad structure to the top of the protective cover shall not be less than three feet to allow for inspection and shall not be attached to the structure. If the Applicant cannot meet these requirements then the Applicant shall provide a removable hatch to allow Railroad personnel to inspect the bridgestructure.

The protective cover shall be removable and can be removed, at the Applicant's expense, without advanced notice if deemed necessary by RFTA.

A protective cover shall be required, meeting the above criteria, for ballast deck bridges unless the superstructure meets the requirements of Section 6.8.4.

7.4 Drainage

The drainage pattern of the site before and after construction shall be analyzed. Adequate drainage provisions shall be incorporated into the plans and specifications. Detailed Hydraulic Report may be required subject to site condition. The Hydraulic report must meet the Railroad design Hydraulic Criteria per Sections 4.5.2 and 4.5.3.

7.5 Fence

The Applicant shall specify the appropriate fencing to contain the Trail traffic, within the Trail, crossing RFTA's right-of-way. Fence limits are subject to each project site and must be determined on a case by case basis. Refer to Section 4.6 for fence requirements and Plan No. 711000, sheet 1 for fence details.

All Railroad right-of-way fencing, for Trails adjacent to RFTA's right-of-way, must be provided, installed outside Railroad right-of-way and maintained by the Applicant.

7.6 Signs

All access to Trails crossing railroad track shall be protected with bollard posts and signs prohibiting non-authorized vehicular access.

All advisory and regulatory signs shall be in compliance with MUTCD and AASHTO. "No Trespassing" signs shall be posted every 500 feet.

7.7 Lighting

Adequate lighting shall be provided per AASHTO Roadway Lighting Design Guide requirements. Dark confined and isolated Trail crossings are hidden from public view may attract illegal activities. Line of sight is extremely important when visibility is a matter of safety and security. The lighting design shall account for the impact on train operations.

Lighting shall provide visibility for the Trail without directing light toward the train traffic.

8.0 APPENDIX – APPENDIX DRAWINGS A-1 THROUGH A-22 ARE FOLLOWING:

5. Guideline For At-Grade Public & Private Crossings

At-grade license requests for private or public road crossings will be considered on a case-by-case basis. In general, RFTA's objective is to avoid any net new crossings and to strive for consolidation of existing crossings when practicable. Within that policy, applications for licenses for new or amended road crossings will be considered on a case-by-case basis.

As stated in Parts 1 and 2 of this document, federal guidance laid out in 2008's Railway Safety Improvement Act and 23-USC-130 aims to reduce the total number of at-grade crossings by 50% by elimination or consolidation of at grade crossings. To the extent practicable, in order to preserve RFTA's corridor for future rail reactivation and for commuter rail use, RFTA believes it prudent to apply the federal guidelines to the management of the railbanked rail corridor. This should also result in a safer interim trail and better open space values on the corridor.

RFTA subscribes to the suggested standards put forth by AASHTO (A Policy on Geometric Design of Highways and Streets, 6th Edition), AREMA's Manual for Railway Engineering Chapters 1 and 5 (part of Volume 1 0f 4, especially 5.8.1 thru 5.8.7) and FHWA (Railroad-Highway Grade Crossing Handbook - Components of a Highway-Rail Grade Crossing)

From FHWA's "Components of a Highway-Rail Grade Crossing":

The geometric features that can affect traffic operations at highway-rail grade crossings include:

- Number of lanes and pavement width.
- Horizontal and vertical alignment.
- Crossing angle.
- Crossing elevation.

These features, in turn, affect sight distances to and at crossings.

Number of lanes. Only 7 percent of all public crossings are on highways with more than two lanes. It is not known how many crossings with two lanes have an approach width greater than two lanes. The reduction of lanes at a crossing can cause vehicle-vehicle collisions as well as collisions with trains.

At two-lane crossings, a pullout lane may have to be provided for trucks or buses that may be required to stop for the crossing. By providing a pullout lane, the likelihood of rear-end collisions may be reduced as large vehicle and bus drivers comply with non-exempt crossing laws.

Crossings with more than two lanes are usually candidates for cantilevered flashing light signals to improve the visibility of the signals for drivers.
Vertical and horizontal alignment. Sight distance to the crossing is affected by the vertical and horizontal alignment of the crossing and by the crossing angle. Crossings located around a curve or over the crest of a hill may require special attention from the motorist and may need additional signing or active advance warning devices.

- Horizontal Alignment angle shall preferably be tangent track crossed at an angle of between 75° and 90°. Skew angles are discouraged for angles less than 45°. Crossing angles at an angle of less than 75° will require a dismounting area and foot crossing for bicycle traffic.

- Vertical approach grades at the crossing are close to level as possible and MUST meet the joint AASHTO*/ AREMA 5.8.2 joint standard for grades within 30 feet of the crossing. (*A Policy on Geometric Design of Highways and Streets, 6th Edition, aka "The Green Book")

- Vertical curves are not allowed through at-grade crossings. Road surface should attempt to remain in the same plane as the track surface in the crossing, this includes super-elevated curved track and multiple track crossings.

Crossing and approach surfaces. The roughness of a crossing surface and the profile of the surface and its approaches may be major areas of concern for road users. A rough surface may contribute to a collision by diverting the road user's attention from the prime tasks of observing the crossing signals and looking for a train. The roadway agency or private crossing user is responsible for maintenance of the approach grades at the crossing on RFTA's R/W to within 2 feet of the nearest rail. During maintenance operations, the parties performing maintenance are responsible for correctly adjusting the road surface to match the track elevations and the plane of the crossing. Smooth crossing surfaces and approaches guarantee a smooth ride (smooth crossing / no bumps), minimal impact loading to the crossing structure and components, less chance of a high centered combination, easier negotiation of the crossing for smaller vehicles and less road damage.

Crossing elevation or profile. Another aspect of the crossing is its elevation. Vehicles that must cross the tracks from a stopped position cannot accelerate quickly on steep grades. In addition, trucks with low ground clearances may become trapped on high-profile or "hump-backed" crossings, delaying highway and rail traffic and, possibly, being struck by a train.

Intersecting highways. Approximately one-third of all public highway-rail crossings have an intersection within 23 meters (75 feet) of the tracks. Frequently, roads parallel the railroad and intersecting roads intersect the railroad, resulting in a crossing near the highway intersection.

The higher occurrence of collisions at these intersections is due in part to a short storage area for vehicles waiting to move through the crossing and the intersection. If the intersection is signalized or if the approach from the crossing is controlled by a STOP sign, queues may develop across the crossing, leading to the possibility of a vehicle becoming "trapped" on the crossing.

Also, there are more distractions for the motorist, leading to the possibility of vehicle-vehicle conflicts.

Crossings within a close distance to a signalized or STOP-controlled intersection should be carefully evaluated for proper controls. STOP controls should be evaluated where either the crossing or the intersection, or both, is not signalized. Traffic signal timing should be carefully evaluated, and an interconnection circuit installed if needed. Joint inspections of interconnected or preempted signals by RFTA and the highway agency must be made on a regular basis to assure that the crossing signals and the highway traffic signal are functioning properly and that the phasing and timing plans are still appropriate.

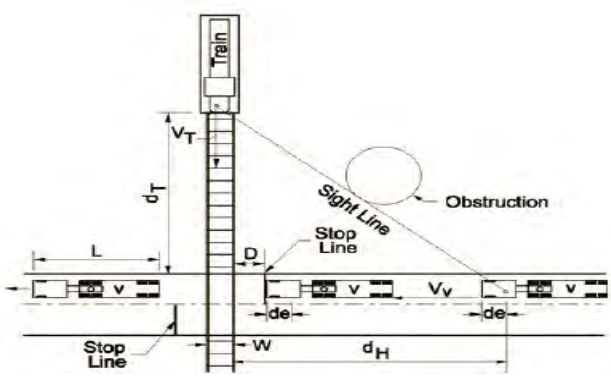
The critical distance between a highway-rail crossing and a highway-highway intersection is a function of the number of vehicles expected to be queued up by the intersection traffic control.

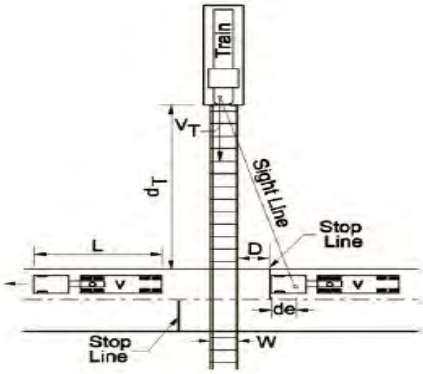
In the case of major adjustments to existing at-grade crossings, an engineering plan set of drawings showing current conditions and designed future elevation and alignment of the roadway showing compliance with AREMA, AASHTO and FHWA standards. Any submitted drawings will show ties to the RFTA survey control monuments (at least two) and conversion to RFTA's survey datum if not used as the basis of the drawing. With public crossings, any changes to the at-grade crossings width, use or

crossing protection will require Public Utility Commission approval, to the extent that the Commission has jurisdiction over 16 U.S.C. 1247(d) rail trails. The Colorado PUC will expect an agreement between RFTA and the road agency before it investigates and comments on public road crossing issues. Changes to private crossings and their approaches on railroad corridor property will require written approval from RFTA and its engineer.

Sight Distance Easement Cautions:

Any new or heavily modified at-grade crossing will require preservation of road crossing approach sight distance parameters as shown in the FHWA Road Crossing Handbook and required under FRA/FHWA's proposed model law. Any new design drawings for new crossings and /or major reconstructions need to show the limiting factors at a grade crossing for vision distance to both the Colorado PUC's railroad engineer and RFTA's engineer. Vision distance issues will play a major part in the diagnostics behind the choice of future crossing protection in the corridor.





[FHWA/WSDOT/RFTA]

Case 1 Departure from stop		Case 2 Moving Vehicle						
Train Speed (mph) V_T	0	Vehicle Speed (mph) V_V						
		10	20	30	40	50	60	70
		F=0.40	0.40	0.35	0.32	0.30	0.29	0.28
		Distance Along Railroad from Crossing d_T (ft)						
10	240	150	100	100	100	110	120	130
20	480	290	210	200	210	220	240	270
30	720	440	310	300	310	340	370	400
40	960	580	410	390	410	450	490	540
50	1200	730	520	490	520	560	610	670
60	1440	870	620	590	620	670	730	810
70	1880	1020	720	690	720	790	860	940
80	1920	1160	830	790	830	900	980	1070
90	2160	1310	930	890	930	1010	1100	1210
		Distance Along Highway from Crossing d_H (ft)						
		69	135	220	324	447	589	751
Required design sight distance for combination of highway and train vehicle speeds; 65 ft truck crossing a single set of tracks at 90°. (AASHTO)								

(FHWA/AASHTO)

http://safety.fhwa.dot.gov/xings/com_roaduser/07010/07010.pdf FHWA Road Crossing Handbook-2007

6. Trail Access Guideline

PEDESTRIAN / BICYCLE /TRAIL CROSSINGS & ENCROACHMENTS: A pedestrian crossing/encroachment is defined as any location where the pedestrian leaves the sidewalk/trail and enters RFTA's roadway. Access points can be public and or private in nature in the same respect as vehicle roadways. At a pedestrian crossing, the pedestrian's path of travel crosses the motorist's/railroad's path of travel. Pedestrian crossings include individually dedicated crossings and street intersections.

At individually dedicated crossings, pedestrians generally encounter traffic moving in two directions. Overpasses and underpasses route pedestrians above or below vehicular / rail traffic and therefore are addressed as variations in the design of the rail corridor. (FTA/FHWA) Crossings are generally non- motor vehicle in nature and barricaded to prevent motor vehicle access. Bicycle crossings at skew angles should mandate dismounting and walking the bicycle over the at-grade flangeways or changes in alignment to cross at right angles. (FRA/MUTCD/AREMA)

ANY OPENING AT A LOCATION OTHER THAN A PUBLIC/PRIVATE/RFTA USE CROSSING MUST HAVE A SIGN AT THE OPENING SHOWING THE RFTA CONTRACT NUMBER AND LOCATION COVERED BY THAT CONTRACT (OWNER'S NAME IS OPTIONAL)

Private trail access points must have a secure and substantial lockable gate at the right of way line to discourage non-authorized use/ trespass. Unauthorized entry points are to be barricaded or otherwise discouraged from being used to prevent prescriptive rights issues where RFTA no longer has exclusive control of its assets.

Trail access is governed by RFTA's Trail Management plan and administered by RFTA's Trail Facility Manager and staff. Design principles are located in:

- RFTA's Trail Management Plan
- AASHTO "Guide for the Development of Bicycle Facilities, 4th Edition" https://bookstore.transportation.org/collection_detail.aspx?ID=116 or Appendix A
- FHWA –FTA - United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations http://www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/policy_accom.cfm

  http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/bp-guid.cfm (See section 10, Design Guidance); http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm

7.0 ENCROACHMENTS

7.1 Encroachments on the RFTA Right-of-Way

For the purpose of this document, encroachments on the RFTA Right of way are any use of any portion of the Railroad Corridor without the permission of RFTA. structures or uses that may not cross the RFTA Corridor, but occupy some portion of it, such as an errant fence, a building that is not within the proper legal subdivision, and the unpermitted utility pole, a retaining wall on RFTA property, or pasture or agricultural use of RFTA's corridor.

It is RFTA's policy to eliminate an encroachment that could pose a significant obstruction to freight rail reactivation, commuter rail use, trail use, open space use, or a violation of the Great Outdoors Colorado Conservation Covenants. In addition, all encroachments constitute unapproved trespass unless the party seeking to use the encroachment obtains a 30-day terminable license for the encroachment. It is RFTA's policy not to license any encroachment for the following:

- Vehicle storage
- Waste or debris storage
- Fuels and combustibles
- Roadway or long-term single use driveways
- Materials not native to the site

Upon termination or expiration of a license, any licensed encroachments must be totally removed and the site promptly restored at the expense of the party holding the license. Licenses to encroach shall not be deemed to run with the land (chain of title), RFTA reserves the right to insist on a new license in the event of any assignment request. RFTA reserves the right to insist upon being named as third-party

insured under an existing policy, or that the applicant for a license obtain insurance for RFTA, in an amount stated by RFTA before the encroachment in question may be initiated. In all events, the encroaching party shall hold RFTA harmless from all claims of liability for personal injury or property damage, including attorneys' fees, arising from the encroachment.

All encroachments should be duly located by proper survey methods listed in Section 4.6 of this document with a sketch/drawing, as indicated in RFTA's contract/license agreement forms.

7.2 Drainage: Cross & Lateral Drainage Minimums

RFTA has adopted AREMA's Manual for Railway Engineering, Chapter 1, Part 3 "Natural Waterways", Part 4 "Culverts" as its base drainage design documents for the railroad corridor. In order to protect the corridor, all structures shall be placed to railroad design criteria where the main track alignment in the Rio Grande Trail Corridor still resides in the corridor. Generally, the former roadbed (including former roadbed elevation) shall be treated as the track alignment for purposes of applicable standards where the track has been removed. Culverts will be placed to meet or exceed Cooper's E80 loading at the proper design depth.

- Should an adjoining landowner seek to direct additional drainage onto or across RFTA's right of way, or to channel existing drainage onto or across RFTA's right of way, that drainage use shall be considered a kind of utility use of RFTA's property and shall be permitted only pursuant to a license similar to other utility licenses.
- Additional drainage directed to RFTA's right of way from new developments or other changes to existing conditions (e.g., channelization onto RFTA property) shall be treated as a crossing. The drainage or water flow shall only be permitted if it does not disrupt the corridor for rail reactivation, commuter rail, trail or open space uses, and then only if the water is moved across RFTA's corridor in a fashion that does not cause pooling, subsidence, or erosion, and is consistent with the GOCO conservation covenants. Use of existing natural drainage ways is encouraged.
- Parallel drainage ways are to be discouraged. Any RFTA roadbed embankment immediately adjoining a modified drainage way will be armored against erosion and water penetration into the embankment fill and track subgrade areas. All costs to modify RFTA property to avoid erosion, subsidence or pooling, or to otherwise direct drainage from adjoining property shall be borne by the drainage licensee
- Ponding or standing water on the right of way will not be allowed.
- In the event a party seeks a license from RFTA for an Irrigation Channel improvement or tailwater ditch modification, the party must disclose on the RFTA license application the applicable water right on file with the State Engineer. The repurposing and design use of its existing drainage structures to be dual purpose structures are not allowed.

From the AREMA Manual Chapter 1, "Roadway" – The following Parts are adopted as RFTA's Design Guidelines:

Section Title 2014 Manual Page

3.1 Natural Waterways 1-3-1
3.2 General 1-3-5
3.3 Hydrologic Capacity of Waterway Openings 1-3-5
3.4 Determination of Hydraulic Capacity of Structures 1-3-27
3.5 Basic Concepts and Definitions of Scour 1-3-49
3.6 Calculating Scour 1-3-53
3.7 Protecting Roadway and Bridges From Scour 1-3-89
3.8 Means of Protecting Roadbed and Bridges from Washouts and Floods 1-3-174
3.9 Construction and Protection of Roadbed Across Reservoir Areas 1-3-176
3.9 9 Glossary 1-3-185
4. Culverts 1-4-1
4.1 Location and Type 1-4-6
4.2 Specifications for Placement of Reinforced Concrete Culvert Pipe 1-4-10
4.3 Specifications for Prefabricated Corrugated Steel Pipe and Pipe-arches for Culverts, Storm Drains and Underdrains 1-4-10
4.4 Specifications for Coated Corrugated Steel Pipe and Arches 1-4-17
4.5 Standard Specification for Corrugated Aluminum Alloy Pipe 1-4-17
4.6 Specifications for Corrugated Structural Steel Plate Pipe, Pipe-arches, and Arches 1-4-23
4.7 Specifications for Corrugated Structural Aluminum Alloy Plate Pipe, Pipe-arches, and Arches 1-4-26
4.8 Specifications for Corrugated High-Density Polyethylene Pipe 1-4-28
4.9 Hydraulics of Culverts 1-4-29
4.10 Design Criteria for Corrugated Metal Pipes 1-4-57
4.11 Design Criteria for Structural Plate Structures 1-4-74
4.12 Structural Design Considerations of Corrugated High-Density Polyethylene Pipes 1-4-79
4.13 Culvert End Treatments 1-4-80
4.14 Assembly and Installation of Pipe Culverts 1-4-84
4.15 Earth Boring and Jacking Culvert Pipe through Fills 1-4-89
4.16 Culvert Rehabilitation 1-4-91
4.17 Specification for Steel Tunnel Liner Plates 1-4-96
4.18 Construction of Tunnel Using Steel Tunnel Liner Plates 1-4-104
4.19 Culvert Inspection 1-4-105
4.20 Perforated Pipe Drains 1-4-114
4.21 Commentary 1-4-118

AREMA's Manual can be acquired as the whole manual or by Chapter at www.AREMA.org https://www.arema.org/catalog.aspx (Chapter 1 "Roadway" applies to the listed sections)

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7.3 Environmental Access/ Cleanup

RFTA's policy is to avoid adverse environmental impacts in the management of its rail trail corridor.

It shall be RFTA's policy to direct its staff routinely to inspect the corridor for adverse conditions, including illegal waste disposal, unusual liquid drainage or runoff, trash dumping, unusual discolored vegetation, and general unwanted trespassing. RFTA staff are further directed to report observed violations or potential violations of environmental laws, or trespass, to appropriate authorities and agencies. RFTA will also consider seeking damages for trespass in the event of unlawful waste disposal, unlawful run-offs, or other unpermitted entry into the property.

If a party seeks to sample surface or subsurface soil, sediments or groundwater, or to install wells or other monitoring facilities associated with the environmental investigation or remediation for a crossing or other activity affecting RFTA's right of way, RFTA reserves the right to require a license application and approval before commencement of activities. In order to evaluate the need for a license, in all events, a Work Plan must be submitted and approved by RFTA prior to commencing work. A copy of the work plan must be kept on site at all times.

7.4 WORK PLAN

All Environmental Access Applications Must Start With A Work Plan

The Work Plan must be submitted and approved prior to entry on RFTA property. The work plan must include the following items:

- Point of Access, preferably tied to RFTA's survey control network
- Outline of Areas to be impacted both on the drawing and on an aerial from Google Earth (kmz file)
- Sampling locations (surface or subsurface soil, sediments, and groundwater)
- Methods of securing sample, the frequency of samples, chemical analyses
- Health and safety measures for Applicant's Workers, Railroad Workers, and any other workers on the site.
- Training required for onsite workers (BNSF/UP Contractor Orientation, 40-hour OSHA, etc.)
- Pollution prevention measures
- Runoff Management
- Waste Management and disposal plan

- Plugging, abandonment of physical features added to the site by Applicant
- Site restoration plan
- Expected Date of data to be shared with RFTA (and possibly Union Pacific at Glenwood)
- Copies of any decree, consent order, etc. which is governing the proposed work by Applicant

The Work Plan will only be initiated with RFTA consent. RFTA reserves the right to require a license for before implementation of the work plan, including insurance provisions and other provisions protecting RFTA from liability prior to implementation of any work plan. RFTA also reserves the right to condition approval upon an appropriate RFTA representative being on site at times deemed relevant by RFTA. At RFTA's request, all results from monitoring shall be promptly supplied to RFTA.

Minimum information to be submitted with work plan: (Please copy, fill out, and submit to RFTA)

IS THIS AN EMERGENCY REQUEST? DATE OF REQUEST:_____

Yes ◯
No ◯

IF YES, CASE OF EMERGENCY (W/ Accident Report #)

Legal name of company/municipality who will occupy the property:

If a corporation, State in which incorporated:

(If not incorporated, please attach name(s) of owners or

partners.) Mailing Address:

Daytime Phone:

FAX:

Contact Name:

Email Address:_____

Is an adjoining landowner involved? _____

Yes ◯
No ◯

Name(s) and Address (es):

_____

_____

Is the work to be conducted under an agency oversight?

Yes ◯
No ◯

If yes, agency name:

Enclose a copy of the consent order, decree, etc.

Is this project ARRA or EPA funded?

Yes ◯
No ◯

Is applicant a condemning authority?

Yes ◯
No ◯

Is applicant a former Railroad Shipper on the line?

Yes ◯
No ◯

If yes, name: _____

Contract_____

Phone #_____

Was this service requested by RFTA?

Yes ◯
No ◯

If yes, person requesting service:_____

Phone #_____

Is this installation in conjunction with a track or track expansion project? Yes/ No

If yes, RFTA contact name:_____

Phone #_____

Name of nearest town/station on RFTA Corridor: _____

County_____

State: COLORADO

Location of proposed occupancy:

_____1/4

Section_____

Township_____

Range_____

Railroad Mile Post_____

Latitude_____DMS

Longitude_____DMS

How far from the track or trail will the work be performed?_____ft.

Is work to be performed within 50 ft. of RR Corridor property?

Yes ☐

No ☐

If yes, what percentage?_____

Area to be occupied:_____ft. length (x)_____ft. width

Square Feet_____ Acres _____

Date:_____

Signed:_____

Print Name:_____

Title:_____

Phone #:_____

FAX:_____

Joint Facilities with Union Pacific in Glenwood Springs are directed to the following location on Union Pacific's website: http://www.up.com/real_estate/environmental/procedures/index.htm

CONTRACTOR INFORMATION:

NAME OF CONTRACTOR: _____

INCORPORATED IN WHAT STATE_? _____

FULL MAILING ADDRESS:

NAME & TITLE OF CONTRACTOR CONTACT PERSON _____

CONTRACTOR TELEPHONE NUMBER _____

CELL PHONE/ FIELD CONTACT NUMBER_____

CONTRACTOR FAX NUMBER_____

E-MAIL ADDRESS_____

LICENSE NO._____

REMEDIATION PROJECT LEVELS:

_____PHASE I (Non-invasive & non-intrusive visual site inspection and records check only.

No sampling will be involved.)

_____PHASE II (Site investigation. You must advise specific testing to be performed from the list below on this page.)

_____PHASE III (Site remediation.)

TYPE OF ENVIRONMENTAL TESTING	**NUMBER OF EACH**
Subsurface Soil/Sediment Samples Hand	
Held Auger Borings	
Soil Gas Survey Points	
Boring Drilled w/Soil Samples	
Temporary Piezometer Wells	
Permanent Monitoring Wells	
Recovery Wells & Associated above Ground Equipment Recovery	
Systems & Above Ground Equipment	
Other (Describe fully):	_____

SPECIAL PROVISIONS:

CONFIDENTIALITY (Required for all cases involving sale of former railroad property, mines, and industrial sites & in many other cases.)

RFTA/ RAILROAD FLAGMAN (Required in all Phase II/III cases & many other cases.)

_____

MONITORING WELL (Required for all monitor wells & piezometers.) _____

PROOF OF FINANCIAL CAPABILITY OR PERFORMANCE BOND (Required for all monitor wells, piezometers, & other facilities.)

RFTA reserves the right to include this data into its GIS system for future use.

8.1 General Guidelines And Track Design Standards For The Railroad Corridor

Preface

The following information is provided to help guide the planning and construction process of developing a rail-served facility.

As owner of the former D&RGW Aspen Branch, now Rio Grande Trail Railroad Corridor, RFTA has obligations under the terms of the Bargain & Sale Agreements to allow Union Pacific Railroad (UP) a freight rail easement in the corridor in Glenwood Springs between MP 360.22 to MP 361.73, to maintain a portion of the track for Union Pacific and Amtrak use as a turning facility and for freight rail switching and storage purposes at Glenwood Springs. In order for Union Pacific to operate trains, the track on which Union Pacific operates must meet or exceed Union Pacific Standards. With most of the RFTA corridor being railbanked under a Notice of Interim Trail Use and most of the rail removed in the interim, it is prudent to design and build any trackage in the RFTA Corridor using the UP standard as a minimum standard to guarantee acceptable freight rail service for the reactivation of freight rail service in the corridor and to ensure acceptance by UP related to any improvement in their easement area in Glenwood Springs. These Design Guidelines and Standards incorporate the UP Standard as well as portions of BNSF, AREMA, and other standards, which are all referenced in the Policy Manual Introduction section of this document.

The following design parameters are required for any Rail design in the corridor:

(1) The baseline corridor design criteria is that of a secondary (branch line), non-signaled main track with a 49MPH FRA Class 3 (per 49CFR213) limit.
(2) New construction will be of 115 Lb. per yard rail with 136 Lb. rail in at-grade crossings to promote a stiffer and more durable track modulus in areas of adverse and high impact loadings.
(3) Use of AREMA Common Standard Track work items such as rail, turnouts, and fastenings which have already been agreed to by the two major railroads in Colorado (BNSF and UP) as an effort to generate a savings due to an economy of scale. RFTA stands to benefit by that commonality.
(4) New turnouts will be No. 11 and No. 9 off the main track to reflect the branch line status of the RFTA corridor in the interim.
(5) Guidelines in the RFTA corridor will be kept as close to the original design for the Aspen Branch rail line as possible to protect the operating characteristics of a medium grade freight railroad. Grades over 1.5% are to be discouraged for train handling and component wear reasons. Please remember that the RFTA's Railroad Corridor is now their main line when considering the interpretation of various design standards.

The time required for rail spur construction depends largely on the magnitude of your project and varies; averages presented below represent typical situations. Additional time may be necessary if your project involves road crossings, utilities or requires State permitting approval.

- Track construction without the addition of a Union Pacific turnout averages eleven (11) months.
- Addition of a Union Pacific turnout averages fifteen (15) months.
- Addition of a Union Pacific turnout and signal facilities averages seventeen (17) months.

This technical manual and its drawings will be revised periodically. It is the responsibility of the user to update his/her copy with the most current information.

If you have any questions concerning this guideline or require further assistance, please contact the RFTA Assistant Director, Project Management & Facility Operations or his/her designee at 970-384-4982.

NEW TRACK CONSTRUCTION OVERVIEW

Drawings of Proposed Track Plans

All of the required plan sets (10% Concept Plan, 30% Track Plan, 100% Complete Construction Drawings and Exhibit 'A' Document) are to be submitted to RFTA as the corridor owner (and through UP's Engineering Document Exchange System (DES) website for projects in the Glenwood Springs Freight Rail Easement Area http://216.58.225.184/engr/exchange_docs/).

In the freight rail easement area, if the project will involve modifying UP's signal facilities, submittals and approvals from UP are also required. In such cases, it is likely that RFTA or UP's Designated Consultant's or Signal Department will do all signal design work. This will be coordinated prior to submittal of the 30% Track Plans.

In addition to the construction drawings, the Customer, or Customer's consultant, shall also prepare and submit an Exhibit 'A' document (see **Section 2.04** below) for review and approval. The Exhibit 'A' document is actually a simplified track plan that will be inserted into the Industrial Track Agreement (ITA)

After all, issues are resolved, the project will receive final approval, a cost estimate will be generated and both parties will sign an Industry Track Agreement.

Construction Guidelines

Prior to performing any track construction on RFTA R/W, the following must occur:

a) A fully executed Industry Track Agreement is in effect, if applicable.
b) The designated RFTA project representative must be notified in writing at **least fifteen working days** prior to the start of construction so that appropriate safety precautions may be taken. Any flagging protection, if required, shall be provided by RFTA and shall be at customer expense.
c) Union Pacific's Telecommunications Operation Center must be contacted at 1-800-336- 9193 for fiber optic information prior to track construction in Union Pacific's easement area. The Contractor is also responsible for securing dig permits for any other utility work within the work limits from the appropriate call before you dig service. The Dig Ticket/ Permit # must be shown to RFTA prior to any work in the corridor.

The industrial track(s) must be constructed per approved plans; written approval for any changes must be obtained prior to construction. The rail contractor must abide by the **Minimum Safety**

Requirements for Customer Contractors Entering Railroad Property set forth in **Section 1.00**. Upon completion of the entire rail project, RFTA must be contacted for inspection and final approval of all grading and track work. If UP inspection is also required, RFTA shall coordinate their inspection activities. If the actual track construction differs from the originally approved design, RFTA may request field surveyed "as built" drawings of the industrial track from the customer. The “as built” drawings will show the corrected stationing, geometry, structures, and clearances. The ITA will then be amended, if necessary.

Costs Associated with Track Construction

All design, engineering, and construction are at the Customer's expense, including flagging protection. Grading construction includes overhead or underground utility adjustments, the installation of drainage facilities or structures under or along the proposed trackage, clearing, grubbing, any required fill or excavation, compaction, stabilization, and placement of subballast both on and off the RFTA R/W. Private track construction will include but is not limited to rail, ties, ballast, turnouts, road crossings, miscellaneous track material, and the labor.

Signal Work for Track Connection

Any signal work associated with connecting a new industry track to an existing RFTA owned track will be constructed by RFTA or Union Pacific approved contractors, at the Customer’s expense. RFTA will examine the same on a case by case basis. If the portion of track owned and operated by the Customer crosses public streets, all signal construction and maintenance work will be completed by the Customer per RFTA (or UP in the Glenwood Easement area) specifications and American Railway Engineering and Maintenance-of-Way (AREMA) guidelines. (Railway Signal Supply Institute/ RSSI data tied to AREMA design standards will be considered as per AREMA Guidelines)

Road Crossings

As a general policy, RFTA discourages the construction of new public or private roadways across its tracks. If a project requires the construction of a new at-grade crossing across RFTA owned or operated tracks, written approval will be required from RFTA and any applicable State Regulatory Agency. If approved, a separate crossing agreement will be required. The industry will be responsible for obtaining all permits. Crossings may require the installation of automated crossing signals. All cost for both the crossing surfaces and signals will be at the customer’s expense.

Portion of Track to be constructed by Union Pacific or RFTA

Typically, RFTA constructs owns and maintains the connection to any existing Union Pacific or RFTA owned trackage from the switch connection (point of the switch) to the 13-foot clearance point. The 13-foot clearance point is defined as the point on the track where the centerline of two tracks beyond the switch ties are separated by 13 feet such that a rail car either being moved or stored on the track will not interfere with the movement of other rail cars on adjacent main, branch or lead trackage owned by RFTA.

Materials for Track Construction

All materials used for the construction of the proposed track must meet Union Pacific standards as Outlined in **Section 10.0**. RFTA prefers that our customer have their rail contractor furnish RFTA grade/approved track material. Once RFTA has approved the track design, a turnout with connecting

rods, switch stand, and any other required track materials can be purchased from one of Union Pacific's approved vendors. RFTA reserves the right to inspect any and all track material prior to installation, during construction and prior to placement in-service for material defects and workmanship issues before accepting the track for service. The terms associated with the assembly and installation of this material will be outlined in the Industrial Track Agreement. Use of this option may be restricted depending on the location of the project and is subject to RFTA and possibly Union Pacific approval.

1.0 MINIMUM SAFETY REQUIREMENTS FOR CUSTOMERS OR CONTRACTORS ENTERING RFTA PROPERTY AND UNION PACIFIC RAILROAD EASEMENT AREA

1.1 GENERAL SAFETY

Safety of personnel, property, rail operations and the public is of paramount importance in the prosecution of the work pursuant to the project. As reinforcement and in furtherance of overall safety measures to be observed (and not by way of limitation), the following special safety rules shall be followed. The Industry shall keep the job site free from safety and health hazards and ensure that its employees are competent and adequately trained in all safety and health aspects of the job; shall have proper first aid supplies available on the job site so that prompt first aid services can be provided to any person that may be injured on the job site; and shall promptly notify the RFTA of any U.S. Occupational Safety and Health Administration reportable injuries occurring to any person that may arise during the work performed on the job site. The Industry shall also have a non-delegable duty to control its employees, while they are on the job site or any other property of RFTA, to be certain they do not use, be under the influence of, or have in their possession any alcoholic beverage or illegally obtained drug, narcotic or other substance that may inhibit the safe performance of work by an employee.

1.2 ATTIRE AND PERSONAL PROTECTIVE EQUIPMENT

The employees of the Industry shall be suitably dressed to perform their duties safely and in a manner that will not interfere with their vision, hearing or free use of their hands or feet. Only waist length shirts with sleeves and trousers that cover the entire leg are to be worn. If flare-legged trousers are worn, the trouser bottoms must be tied to prevent catching. The employees should wear sturdy and protective footwear. Employees shall not wear boots (other than work boots), sandals, canvas-type shoes or other shoes that have thin soles or heels that are higher than normal. In addition, the Industry shall require its employees to wear personal protective equipment as specified by RFTA and Federal rules, regulations or RFTA/UP officials overlooking the work at the job site. In particular, the protective equipment to be worn shall be:

a) Protective headgear that meets American National Standard-Z89.1-latest revision, it is suggested that all hardhats be affixed with Industry's or industry's contractor's company logo or name.
b) Eye protection that meets the American National Standard for occupational and educational eye and face protection, Z87.1-latest revision. Additional eye protection must be provided to meet specific job situations such as welding, grinding, burning, etc.

c) Hearing protection which affords enough attenuation to give protection from noise levels that will be occurring on the job site.

1.3 EQUIPMENT

All heavy equipment provided or leased by the Industry shall be equipped with audible backup warning devices. If in the opinion of the RFTA representative any of the Industry's, or any of its subcontractors' equipment, is unsafe for use on RFTA's right-of-way, the Industry, at the request of the RFTA representative, shall remove such equipment from the RFTA right-of-way.

2.0 REQUIRED INFORMATION TO BE SHOWN ON SUBMITTALS

These requirements cover the following submittals:

1.) 10% design print submittal. After the initial onsite meeting with the RFTA Corridor Manager (and possibly the UP Manager of Industry and Public Projects (MIPP) for work in the UP Glenwood Springs joint easement area), this "plan view only" document can be developed using the information collected at the onsite meeting, property plats, aerial photos, UP valuation maps, RFTA maps, and information, etc., without the need of a formal site survey, however, a site survey is recommended and is required for the 30% and subsequent submittals. This 10% drawing shall be used by RFTA to determine the feasibility of proceeding with the project with respect to with freight rail reactivation and other uses for which RFTA has obligated itself.

2.) 30% design document submittal. This submittal is required if the track project affects RFTA's signal system. The need for this step will be determined the review process of the 10% design document. In the case of signal work on RFTA exclusively owned and operated right-of-way, RFTA's designated signal consultant will do the work. In the UP Easement area, UP's Signal Department will do all signal design work.

3.) 100% Complete set of engineering drawings and specifications. These drawings and specifications should include all plan and profile drawings, material specifications, design calculations, etc. required to obtain final approval from RFTA and to construct the project.

4.) Exhibit 'A' document. This drawing is a simplified track plan included as an exhibit in the Industry Track Agreement (ITA). Because the ITA is a legally binding document, the Exhibit 'A' document must be accurate and easy to interpret. (See RFTA's Survey Standards)

2 .01. REQUIREMENTS FOR A 10% TRACK DESIGN PRINT SUBMITTAL

The first submittal to RFTA consists of a concept plan and profile drawing showing the intention of the work to be performed. The drawing shall take into consideration utilities, drainage, road crossings, and clearances. This first step will be considered the 10% level submittal. The following information should be addressed, if applicable, on the design documents

2.1.1 TURNOUTS - Show all existing turnouts (within 1500' of the limits of the construction area) and proposed turnouts, including size (No. 11, No. 15, etc). Show the Engineering Station (ES) of each point of the switch. On all proposed single ended tracks, this shall be ES 0+00. If the proposed track is double-ended, the turnout located closest to the RFTA's lesser Milepost (MP) shall be designated as ES 0+00. Each point of switch shall also be identified by RFTA/UP's ES and MP (i.e., UPRR ES 23+42/MP
46.90 = ES 0+00 Track 'A'). RFTA corridor surveys and the former D&RGW valuation maps can help you determine turnout sizes, ES, and MP locations.

2.1.2 TRACKS - Show a plan view of all track arrangements including existing tracks, proposed tracks, and future tracks. All existing tracks are to be designated by their unique track identification, Zone Track Spot (ZTS) number; (RFTA can provide these track numbers and their ICC counterparts). All proposed or future tracks should be designated as Track 'A', Track 'B', etc. On all proposed tracks, show the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses the R/W, if applicable, and the ES of the end of track (EOT), including the type of EOT device. On all proposed tracks, show the right-angled center to center distances between any close (25' or less) tracks.

2.2.3 TRACKS – PROPOSED SALE OR LEASE - Show any proposed sale or lease of an existing RFTA owned track (or portion thereof) that is required as part of the construction plan, including the ES for the beginning and end of the proposed sale or lease.

2.2.4 RIGHT OF WAY (R/W) - Show the existing RFTA R/W, if applicable, and the right-angled distance to the track the R/W is tied to. This information is shown on RFTA R/W maps and corridor surveys filed at the appropriate county.

2.2.5 ROAD CROSSINGS - Show the ES/MP location of the centerline of all existing and proposed roads crossing RFTA tracks, the type of crossing material (concrete, wood, etc.), the length of crossing, type (public/private), and the type of crossing warning device. All road crossings within fifteen hundred feet (1500') of a proposed turnout that has any type of electric warning device must be located and shown on the print. Please note, if a new road crossing is proposed near an existing one, the crossing warning devices may have to be upgraded and if it is a public crossing, dealings with the Colorado PUC are required.

2.2.6 BUILDINGS - Show all existing and proposed buildings adjacent to any existing or proposed tracks, including any unloading doors, ramps, docks, etc. Show the right-angled distance from any track within fifty-foot (50') of these buildings, doors, ramps, and docks, etc.

2.2.7 HORIZONTAL CURVES - Horizontal curves are defined using the 100-foot chord definition method. Show a short line perpendicular to the beginning/end of spiral and curve points. Show the Degree of Curve and the ES of these curve points.

2.2.8 OPERATING PLAN - Provide an explanation of your proposed operating plan for the project. Operating plan should include the number of cars delivered and released and the proposed timing of these movements. The plan should also include any additional movements (if necessary) planned within the facility. Include any other details as necessary. This information will be used by RFTA and its consultants to determine if your plan is workable with the reactivation of freight rail service.

2.2.9 SCOPE OF WORK - Provide a Scope of Work showing work to be performed. Specifically, define turnouts to be installed and length of track to be constructed.

2.2.10 DRAWING STANDARDS - Acceptable plan scale: Generally, 1" = 100' or 1" = 200' in an 11"x17" Adobe Acrobat PDF format only. Use common railroad graphical standards (The ICC/ AREA Chapter 10 symbols unchanged since 1915; simplicity is key, no fancy linework). All pages constituting your 10% plan should be loaded as a single PDF file, with the exception that file size should not exceed 20 mg. If the file

size exceeds 20 MB it should be split into pieces, not to exceed 20 MB. Show a directional north arrow, the name of the main track, the Timetable direction of the track and the existing Timetable station on each side of the proposed turnout, or turnouts. RFTA's trails manager has documents that can help with getting this information. Plan scale of 1" = 400' is also acceptable for the 10% Plan only.

2.1.11 PARTIES INVOLVED - submit a contact sheet complete with the Industry or rail users Name, Project Location, and the Design Firm's Name, Address, and Phone Number. The sheet should show the names, email addresses and office/cell phone numbers for the appropriate people involved in the project.

2.1.12 ROADS OR ROADWAY MODIFICATIONS - Show all proposed access roads or roadway modifications etc. not crossing RFTA tracks or R/W that would affect the amount of traffic crossing RFTA tracks & corridor. Include location, width, and type of roadway surface.

2.02.01 REQUIREMENTS FOR A 30% INDUSTRIAL TRACK DESIGN PRINT SUBMITTAL

After the 10% document approval, the process of preparing the complete design documents begins. The purpose of the 30% document is to establish the exact location of the turnout in RFTA's track and to provide a complete review and comments on the preliminary design/engineering documents. This "exact location" can be affected by a number of factors. Each project has its own particular circumstances that will affect the final turnout placement. If the location of a turnout in RFTA's signaled mainline section has to be moved after the 30% Plan approval, the signal design will have to start over, causing delays and increased costs. Also, at this point, the signal design, if required, usually can begin. Following is information needed for the proper signal design. Some of this information will already be on the 10% submittal.

2.2.1 TURNOUTS - Show all existing turnouts (within 1500' of the limits of the construction area) and proposed turnouts, including size (No. 11, No. 15, etc). Show the Engineering Station (ES) of each point of the switch. On all proposed single ended tracks, this shall be ES 0+00. If the proposed track is double-ended, the turnout located closest to the UP/RFTA's lesser Milepost (MP) shall be designated as ES 0+00. Each point of the switch in the main track shall also be identified by Engineer Profile Station (ES) and MP (i.e., UPRR ES 23+42/MP 46.90 = ES 0+00 Track 'A'). The RFTA mapping on hand can help you determine turnout sizes, ES, and MP locations.

2.2.2 TRACKS - Show a plan view of all track arrangements including existing tracks, proposed tracks, and future tracks. All existing tracks are to be designated by their unique track identification, Zone Track Spot (ZTS) number. All proposed or future tracks should be designated as Track 'A', Track 'B', etc. On all proposed tracks, show the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W, if applicable, and the ES of the end of track (EOT), including the type of EOT device. On all proposed tracks show the right-angled center to center distances between any close (25' or less) tracks.

2.2.3 TRACKS PROPOSED SALE OR LEASE - Show any proposed sale or lease of an existing RFTA owned track (or portion thereof) that is required as part of the construction plan, including the ES for the beginning and end of the proposed sale or lease.

2.2.4 RIGHT-OF-WAY (R/W) - Show the existing RFTA corridor R/W, if applicable, and the right-angled distance to the track the R/W is tied to. This information is shown on RFTA's filed maps and former D&RGW ICC Valuation Maps for the Aspen Branch.

2.2.5 ROAD CROSSINGS - Show the ES/MP location of the centerline of all existing and proposed roads crossing RFTA and UP tracks, the type of crossing material (concrete, wood, etc.), the length of crossing, type (public/private), and the type of crossing warning device. All road crossings within fifteen hundred feet (1500') of a proposed turnout that has any type of electric warning device must be located and shown on the print. Be advised, if a new road crossing is proposed near an existing one, the crossing warning devices may have to be upgraded**.**

2.2.6 BUILDINGS - Show all existing and proposed buildings adjacent to any existing or proposed tracks, including any unloading doors, ramps, docks, etc. Show the right-angled distance from any track within fifty-foot (50') of these buildings, doors, ramps, docks, etc.

2.2.7 HORIZONTAL CURVES - Horizontal curves are defined using the 100-foot chord definition method. (ARC Definition curve data can be shown in parentheses, but is secondary to railroad chord definition). Show a short line perpendicular to the beginning/end of spiral and curve points. Show the Degree of Curve and the ES of these curve points.

2.2.8 OPERATING PLAN - Provide an explanation of your proposed operating plan for the project. Operating plan should include the number of cars delivered and released and the proposed timing of these movements. The plan should also include any additional movements (if necessary) planned within the facility. Include any other details as necessary. This information will be used by RFTA and its consultants to determine if your plan is workable with the reactivation of freight rail service.

2.2.9 SCOPE OF WORK - Provide a Scope of Work showing work to be performed by RFTA, UP and the track user. Specifically, define turnouts to be installed and length of track to be constructed by RFTA or UP. In addition, define all work to be done by the new track user or industry.

2.2.10 DRAWING STANDARDS - Your plans should include the correct elements shown to clearly communicate the design intent and detail elements to RFTA (you can use UP Standard Legend and Abbreviations Drawing (see UP **Exhibit 'GL001' Drawing**) as a guideline located here http://www.uprr.com/aboutup/operations/specs/track/index.shtml if you prefer). Acceptable plan scale: 1" = 100' or 1" = 200' in an 11"x17" Adobe Acrobat PDF format only. All pages constituting your 30% plan should be loaded as a single PDF file, with the exception that file size should not exceed 20 MB. If the file size exceeds 20 MB it should be split into pieces, not to exceed 20mg. Show a directional north arrow, the name of the main track, the Timetable direction of the track and the existing Timetable station on each side of the proposed turnout, or turnouts.

2.2.11 CONTACT DATA Send a transmittal sheet complete with the Industry's Name, Project Location, and the Design Firm's Name, Address, and Phone Number.

2.2.12 ROADS OR ROADWAY MODIFICATIONS - Show all proposed access roads or roadway modifications etc. not crossing RFTA tracks that would affect the amount of traffic crossing RFTA tracks. Include location, width, and type of roadway surface.

2.2.13 EXISTING TRACK PROFILE - Provide a top of rail profile of the existing track where the new

turnout(s) will be installed. The maximum interval is one hundred foot (100'). The profile shall extend two hundred feet (200') ahead of the point of the switch and two hundred feet (200') behind the end of the long switch ties.

2.2.14 RFTA STATIONING AND BENCHMARK - Provide a description and ES of the point that RFTA stationing was established from (existing turnout, bridge back wall (face of dump-planks), CL of road crossing, etc.); Also provide a description and location of the benchmark used to establish elevations for the project. SEE RFTA SURVEY REQUIREMENTS

2.2.15 CONSTRUCTION PLAN - Provide a construction schedule showing the planned duration of major activities along with a proposed phasing plan.

2.2.16 SIGNAL INFORMATION REQUIRED - Show all existing insulated joints within five hundred feet (500') of any proposed turnout. Show all signal houses, bungalows, cases, etc. within five hundred feet (500') of any proposed turnout. Show the location of any overhead or underground signal lines in the project area. (Utility Survey and Colorado UNCC involvement required like any other utility survey)

2.2.17 TRACKS (Additional Information) - On all tracks, show the total length, the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W (if applicable) and the ES of the EOT (end of track) including the type of EOT device. (Bumper, wheel stop, berm, etc.) Show the right-angled center to center distances between all tracks.

2.03.01 REQUIRED INFORMATION TO BE SHOWN ON COMPLETE PLANS

The following information is to be provided on the complete construction plan set. Some of the following required information will already be shown on the 10% and 30% (if applicable) Industrial Design Prints.

2.3.2 TURNOUTS - Show all existing turnouts (within 1500' of the limits of the construction area) and proposed turnouts, including size (No. 11, No. 15, etc). Show the Engineering Station (ES) of each point of the switch. On all proposed single ended tracks, this shall be ES 0+00. If the proposed track is double-ended, the turnout located closest to the RFTA's lesser Milepost (MP) shall be designated as ES 0+00. Each point of the switch in a UP or RFTA track shall also be identified by RFTA's ES and MP (i.e., RFTA ES 23+42/MP 46.90 = ES 0+00 Track 'A').

2.3.3 TRACKS - Show a plan view of all track arrangements including existing tracks, proposed tracks, and future tracks. All existing tracks are to be designated by their unique track identification, Zone Track Spot (ZTS) number; All proposed or future tracks should be designated as Track 'A', Track 'B', etc. On all proposed tracks, show the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W, if applicable, and the ES of the end of track (EOT), including the type of EOT device. On all proposed tracks, show the right-angled center to center distances between any close (25' or less) tracks.

2.3.4 TRACKS - PROPOSED SALE OR LEASE - Show any proposed sale or lease of an existing RFTA owned track (or portion thereof) that is required as part of the construction plan, including the ES for the beginning and end of the proposed sale or lease.

2.3.5 RIGHT-OF-WAY (R/W) - Show the existing RFTA R/W, if applicable, and the right-angled distance to the track the R/W is tied to. This information is shown on RFTA's R/W maps and its filed corridor survey

2.3.6 ROAD CROSSINGS - Show the ES/MP location of the centerline of all existing and proposed roads crossing RFTA's tracks, the type of crossing material (concrete, wood, etc.), the length of crossing, type (public/private), and the type of crossing warning device. All road crossings within fifteen hundred feet (1500') of a proposed turnout that has any type of electric warning device must be located and shown on the print. Be advised, if a new road crossing is proposed near an existing one, the crossing warning devices may have to be upgraded.

2.3.7 BUILDINGS - Show all existing and proposed buildings adjacent to any existing or proposed tracks, including any unloading doors, ramps, docks, etc. Show the right-angled distance from any track within fifty-foot (50') of these buildings, doors, ramps, docks, etc.

2.3.8 HORIZONTAL CURVES - Horizontal curves are defined using the 100-foot chord definition method. Show a short line perpendicular to the beginning/end of spiral and curve points. Show the Degree of Curve and the ES of these curve points.

2.3.9 OPERATING PLAN - Provide an explanation of your proposed operating plan for the project. Operating plan should include the number of cars delivered and released and the proposed timing of these movements. The plan should also include any additional movements (if necessary) planned within the facility. Include any other details as necessary. This information will be used by RFTA and its internal railroad consultant (if required) to determine if your plan is workable with the reactivation of freight rail service.

2.3.9 SCOPE OF WORK - Provide a Scope of Work showing work to be performed by the Industry, RFTA, or UP. Specifically, define turnouts to be installed and length of track to be constructed by UP or RFTA if required. In addition, define all work to be done by the new track user.

2.3.10 DRAWING STANDARDS - Acceptable plan scale: 1" = 100' or 1" = 200' in an 11"x17" Adobe Acrobat PDF format only. All pages constituting your complete plans should be loaded as a single PDF file, with the exception that file size should not exceed 20 MB. If the file size exceeds 20 MB it should be split into pieces, not to exceed 20mg. Show a directional north arrow, the name of the main track, the Timetable direction of the track and the existing Timetable station on each side of the proposed turnout, or turnouts. The RFTA can help with getting this information.

2.3.11 CONTACT & TRANSMITTAL SHEET: Submit a transmittal sheet with a detailed list of all parts of the submittal with Applicant's Name, Project Location, and the Design Firm's Name, Address, and Phone Number.

2.3.12 ROADS OR ROADWAY MODIFICATIONS - Show all proposed access roads or roadway modifications etc. not crossing any tracks that would affect the amount of traffic crossing RFTA tracks. Include location, width, and type of roadway surface.

2.3.13 SIGNAL INFORMATION REQUIRED - Show all existing insulated joints within five hundred feet (500') of any proposed turnout. Show all signal houses, bungalows, cases, etc. within five hundred feet (500') of any proposed turnout. Show the location of any overhead or underground signal lines in the project area.

2.3.14 TRACKS (Additional Information) - On all tracks, show the total length, the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W (if applicable) and the ES of the EOT including the type of EOT device. Show the right-angled center to center distances between all tracks.

2.3.15 EXISTING TRACK PROFILE - Provide a top of rail profile of existing track where the new turnout(s) will be installed. The maximum interval is one hundred foot (100'). The profile shall extend two hundred feet (200') ahead of the point of the switch and two hundred feet (200') behind the end of the long switch ties.

2.3.16 STATIONING AND BENCHMARK - Provide a description and ES of the point that stationing was established from (existing turnout, bridge back wall, the centerline of road crossing, etc.). Also, provide a description and location of the benchmark used to establish elevations for the project.

2.3.17 CONSTRUCTION PLAN - Provide a construction schedule showing the planned duration of major activities along with a proposed phasing plan.

2.3.18 WEIGHT OF RAIL - Show the weight of rail of all existing and proposed tracks and turnouts. No new construction will allow less than 115# rail.

2.3.19 TRACK MATERIALS – Union Pacific's standard rail and tie configurations are to be used (see **Section 10.00**). If any other type of track support system is to be used detailed structural plans and calculations must be provided for review and approval.

2.3.20 TRACK CULVERTS - Show the ES (to centerline), the MP location (if RFTA track), the size, length and type of all existing and proposed culverts (or culvert modifications or extensions) under all existing and proposed tracks. The minimum culvert size allowed under RFTA owned or maintained track is thirty inches (36"). A detailed set of plans shall be submitted to RFTA's corridor managers and consultant(s) for their approval.

2.3.21 TRACK BRIDGES - Show the ES (at each back wall), the MP location (if UP track), the length and type of all existing and proposed bridges (or bridge modifications or extensions) in all existing and proposed tracks (see **Section 7.00**). Also, show the T/R to flowline distance. Ensure that all existing bridges within five hundred foot (500') of any turnout are shown on the print. A detailed set of bridge (or bridge modification) plans (stamped and sealed by a registered Colorado Professional Engineer) shall be submitted to RFTA for its approval.

2.3.22 OTHER DRAINAGE STRUCTURES - Show all existing and proposed drainage structures under all existing and proposed roads and in the construction area that would affect drainage on RFTA property. Show the Direction of runoff across the project and in the vicinity of all tracks to indicate water flow after construction (see **Section 7.00**).

2.3.23 UNDER TRACK STRUCTURES - Show the ES of any existing or proposed under track structure. Provide detailed drawings of any proposed under track structures to RFTA for its approval. These drawings should include the type of construction, placement, and size of reinforcing steel in concrete, the thickness of walls and floor, type and size of rail supporting beams, the weight of rail to be used over the structure, and method of fastening the rail to the beams. All structural plans shall be stamped and sealed by a registered Professional Engineer.

2.3.24 OVERHEAD STRUCTURES - Show the ES of any existing or proposed overhead loading devices, clearance envelope must show the minimum clearances when the device is in use and in the retracted position for train movement (must comply with Colorado 4CCR-723-7 clearance regulations, no exceptions). Detailed drawings of any proposed overhead loading devices, including side-unloading racks with retractable platforms, shall be submitted to RFTA for its approval. Drawings should include size and location of supports, footings, vertical and horizontal clearance.

2.3.25 UTILITIES - All existing or proposed utilities that cross or run within close proximity of any existing or proposed track must be located. Typical utility location requirements are:

1.) Overhead wireline crossings, including the location of poles and vertical clearance above the top of the rail, voltage of line, if applicable, and owner.
2.) Underground utility line crossings, including location and type of line, depth below the base of the rail, proposed encasement details, and owner.
3.) Any underground or overhead utilities within close proximity of any existing or proposed track, including the track's right-angled centerline distance to the line (and poles if applicable), type of utility and owner.

Be advised that no UP-underground facilities will be located by the "One Call" service. RFTA can help arrange for the UP's underground utility location for its underground signal and communications assets.

Please note that UP fiber optic cable systems may be buried on RFTA R/W Property within the limits of your project. UP's Telecommunications Operation Center must be contacted at 1-800-336- 9193 prior to construction. Please get a dig ticket and record that ticket number on all future drawings.

2.3.26 TRACKSIDE DEVICES - Show all car pulling or indexing devices including stationing and clearance.

2.3.27 ELECTRICAL SERVICE - The Customer shall provide electrical service when the proposed track project requires power for facilities such as wayside signals, active warning devices, illumination, impaired clearance signs, or other facilities. Show location, whether overhead or underground and the size of proposed electrical service. Show location of poles and size of wireline for any overhead lights, etc.

2.3.28 FENCES - Show the ES and distance to all existing or proposed fences in the vicinity of any proposed or existing track; including the location of gates crossing tracks (Must meet or exceed Colorado PUC Clearance specification in 4CCR723-7). Please see **Section 8.24** for fence specifications). Also, show the clearance from the center of the track when the gate is open.

2.3.29 TRACK GROUNDING - Show any track, or segment of track, that will be used for loading or unloading of flammable commodities. This track or segment of track, on which a tank car may stand while a flammable liquid or flammable compressed gas is being loaded or unloaded shall be bonded at each rail and grounded (contact RFTA for current requirements).

2.3.30 CLEARANCES - Show all horizontal clearances, at a right angle from the track, to any obstruction within 12 feet (12') of the centerline of all proposed or existing tracks. Also, show the above top of rail (T/R) distance to all overhead crossings of any existing or proposed tracks (see NEC and Colorado Clearance Regulations 4CCR723-7).

2.3.31 PROPOSED TRACK PROFILES - Provide a rail profile of all proposed tracks. The maximum interval is one hundred foot (100'); include the ES of all vertical curve. Be very clear and label the top of rail (T/R) or base of rail (B/R) and note the weight of rail.

2.3.32 ROAD AND DITCH PROFILES - A top of road profile is required (at a maximum of fifty-foot (50') intervals) of any proposed road that crosses RFTA tracks (500 feet or more preferred). A top of road profile is also required (at a maximum of fifty-foot (50') intervals) of an existing road that the number of tracks crossing it is increased (existing and proposed elevations). The ES and elevation (existing and proposed) of all existing or proposed at-grade crossings must be shown on the road profile. If applicable, show any drainage structures with invert elevations and ditch profiles (at a maximum of one hundred-foot (100') intervals.

2.3.33 TYPICAL CROSS-SECTIONS - Provide typical cross-sections showing proposed track sections, any side ditches and all areas requiring a walkway. (See the Walkway Standard in this document).

2.3.34 TURNOUT CONSTRUCTION PAD - Show details of the construction pad used to assemble and install any turnout installed in existing track. Switch panels must have a pad to be assembled on in the construction process, at least 25 feet larger in width and length than the footprint of the switch ties.

2.03.35 REQUIREMENTS FOR THE EXHIBIT 'A' DOCUMENT SUBMITTAL

All industry tracks operated by RFTA or UP are covered by an ITA that specifies each party's responsibility for construction, maintenance, and operations of the industry tracks. The Exhibit 'A' document is actually a simplified track plan inserted into the ITA, and because the ITA is a legally binding agreement, the Exhibit 'A' document must be accurate, easy to interpret and include the following:

2.3.36 TURNOUTS - Show all existing turnouts (within 1500' of the limits of the construction area) and proposed turnouts, including size (No. 11, No. 15, etc). Show the Engineering Station (ES) of each point of the switch. On all proposed single ended tracks, this shall be ES 0+00. If the proposed track is double-ended, the turnout located closest to RFTA's lesser Milepost (MP) shall be designated as ES 0+00. Each point of the switch in any track shall also be identified by RFTA's Engineering Profile Station (ES) and MP (i.e., RFTA ES 23+42/MP 46.90 = ES 0+00 Track 'A').

2.3.37 TRACKS - Show a plan view of all track arrangements including existing tracks, proposed tracks, and future tracks. All existing tracks are to be designated by their unique track identification Zone Track Spot (ZTS) number. All proposed or future tracks should be designated as Track 'A', Track 'B', ETC. On all proposed tracks, show the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W, if applicable, and the ES of the end of track (EOT), including the type of EOT device. ON all proposed tracks, show the right-angled center to center between ay close (25' or less) tracks.

2.3.38 TRACKS - PROPOSED SALE OR LEASE - Show any proposed sale or lease of an existing RFTA owned track (or portion thereof) that is required as part of the construction plan, including the ES for the beginning and end of the proposed sale or lease.

2.3.39 RIGHT-OF-WAY (R/W) - Show the existing RFTA R/W, if applicable, and the right-angled distance to the track the R/W is tied to. This information is shown on RFTA's R/W and corridor maps.

2.3.40 ROAD CROSSINGS - Show the ES/MP location of the centerline of all existing and proposed roads crossing RFTA tracks, the type of crossing material (concrete, wood, etc.), the length of crossing, type (public/private), and the type of crossing warning device. All road crossings within fifteen hundred feet (1500') of a proposed turnout that has any type of electric warning device must be located and shown on the print. Be advised, if a new road crossing is proposed near an existing one, the crossing warning devices may have to be upgraded.

2.4.6 BUILDINGS - Show all existing and proposed buildings adjacent to any existing or proposed tracks, including any unloading doors, ramps, docks, etc. Show the right-angled distance from any track within fifty-foot (50') of these buildings, doors, ramps, docks, etc.

2.4.7 OPERATING PLAN - Provide an explanation of your proposed operating plan for the project. Operating plan should include the number of cars delivered and released and the proposed timing of these movements. The plan should also include any additional movements (if necessary) planned within the facility. Include any other details as necessary. This information will be used by RFTA to determine if your plan is workable with freight rail reactivation.

2.4.8 SCOPE OF WORK - Provide a Scope of Work showing work to be performed by the RFTA, UP, and the applicant/ industry. Specifically, define turnouts to be installed and length of track to be constructed by UP or RFTA.

2.4.9 DRAWING STANDARDS - Acceptable plan scale: 1" = 100' or 1" = 200' in an 11"x17" Adobe Acrobat PDF format only. All pages constituting your Exhibit 'A' print should be loaded as a single PDF file, with the exception that file size should not exceed 20 MB. If the file size exceeds 20 MB it should be split into pieces, not to exceed 20mg. Show a directional north arrow, the name of the main track, the Timetable direction of the track and the existing Timetable station on each side of the proposed turnout, or turnouts.

2.4.10 DRAWING SUBMITTAL AND CUT SHEETS- Include the Applicant Industry's Name, Project Location, and the Design Firm's Name, Address, and Phone Number.

2.4.11 TRACKS (Additional Information) - On all tracks, show the total length, the ES of the thirteen-foot (13') clearance point, the ES of the derail (describe the type of derail), the ES of the point where the track centerline crosses RFTA R/W (if applicable) and the ES of the EOT including the type of EOT device. Show the right-angled center to center distances between all tracks.

2.4.12 TRACK CULVERTS - Show the ES (to centerline), the MP location (if UP track), the size, length and type of all existing and proposed culverts (or culvert modifications or extensions) under all existing and proposed tracks. The minimum culvert size allowed under UP owned or maintained track is thirty inches (36"). A detailed set of plans shall be submitted to RFTA for approval.

2.4.13 TRACK BRIDGES - Show the ES (at each back wall), the MP location, the length and type of all existing and proposed bridges (or bridge modifications or extensions) in all existing and proposed tracks (see **Section 7.00**). Also, show the T/R to flowline distance. Ensure that all existing UP or RFTA bridges within five hundred foot (500') of any turnout are shown on the print. A detailed set of bridge (or bridge modification) plans (stamped and sealed by a registered Professional Engineer) shall be submitted to RFTA (and possibly UP, location dependent) for approval.

2.4.14 UNDER TRACK STRUCTURES - Show the ES of any existing or proposed under track structure. Provide detailed drawings of any proposed under track structures to UP's Structures Department for their approval. These drawings should include the type of construction, placement, and size of reinforcing steel in concrete, the thickness of walls and floor, type and size of rail supporting beams, the weight of rail to be used over the structure, and method of fastening the rail to the beams. All structural plans shall be stamped and sealed by a registered Professional Engineer.

2.4.15 OVERHEAD STRUCTURES - Show the ES of any existing or proposed overhead loading devices, clearance envelope must show the minimum clearances when the device is in use and in the retracted position for train movement. Detailed drawings of any proposed overhead loading devices, including side-unloading racks with retractable platforms, shall be submitted to RFTA's Structures Consultant for approval and verification of compliance. Drawings should include size and location of supports, footings, vertical and horizontal PUC and FHWA clearance.

2.4.16 TRACKSIDE DEVICES - Show all car pulling or indexing devices including stationing and clearance.

2.4.17 FENCES - Show the ES and distance to all existing or proposed fences in the vicinity of any proposed or existing track; including the location of gates crossing tracks (see AREMA fence specifications). Also, show the clearance from the center of the track when the gate is open - MANDATORY

2.4.18 CLEARANCES - Show all horizontal clearances, at a right angle from the track, to any obstruction within 12 feet (12') of the centerline of all proposed or existing tracks. Also, show the above top of rail distance to all overhead crossings of any existing or proposed tracks.

2.4.19 TYPICAL CROSS-SECTIONS – Provide typical cross-section at the same interval as the 100% plans showing proposed track sections, any side ditches and all areas requiring a walkway. (See the Walkway Standard in this document).

3.1 TRACK ALIGNMENT SPECIFICATIONS

Curves (Horizontal & Vertical) – General:

Design curves for RFTA Plan and Profile work, both Horizontal and Vertical, were developed from freight rail criteria contained in the design standards of Union Pacific, BNSF, AREMA, and others.

- Horizontal curves on railroad R/W shall remain chord definition, with simple curves. No spiraled curves shall be used to denote boundaries (there are none in the current RFTA corridor). Horizontal curves are defined using the 100-foot chord definition method. Show a short line perpendicular to the beginning/end of spiral and curve points. Show the Degree of Curve and the Engineering Profile Stationing (EPS) of these principal curve points.

- Spiraled curves shall only be shown for main track design purposes, will be AREMA Talbot 10-Chord Spiral Curves per AREMA 5.3.1. Track Cross Level Elevation in Spiral Curves will be determined per AREMA 5.3.3 and calculated for a 49MPH unsignalled territory (per FRA 49CFR213) using a 1.75-inch unbalance elevation on a freight rail basis. Any use of spiraled curves on design documents will also denote simple curve alignments used to denote boundary lines and shown on the same drawing. Use of Arc Definition curves will require denoting both principal curve parameters for Arc and Chord Definition Curves.

- Turnout curves are to be shown as railroad equivalent curves and must cross-reference the design origin, size of rail and size of turnout (frog number) on design documents.

- Vertical Curves are per BNSF and Union Pacific Standard (Classic) Wellington 1877 / AREA 1962 Standard equations for freight rail use. AREMA 2012 Transit Vertical Curves (AREMA 5.3.6) are not acceptable for freight rail operations and are not included in these standards.

- All curves, both horizontal and vertical, must be tangent at their connection to the gradeline or horizontal alignment. Vertical curves must be provided at breakpoints in profile grade.

- The rate of change shall not exceed 2.0 in summits or sags. Vertical curves shall not extend into limits of turnout switch ties. At-grade road crossing alignments on the highway/roadway alignment are not allowed within 30 feet of the crossing surface.

- Connecting tangents on horizontal alignments must be a minimum 300 feet in length. (to allow for future spiral solutions and to transition railcars between curves, especially reverse curves.)

3.1 Tracks should be designed with the minimum degree of curvature that is practical and attainable. Horizontal curves of 10o 00' (Chord Definition) (Radius = 573.69 feet) or less, any curvatures greater than 10o will require the approval of RFTA (and possibly UPRR or operating railroad), up to a maximum of 12o 30' (Radius = 459.28 feet). Curves greater than 12o 30' must have approval RFTA's board (safety, risk, and practical maintenance implications). The industry should provide justification to RFTA when minimum design criteria for curvature cannot be met. For Unit Train Operations, more conservative design criteria may be required. Use the American Railway Engineering and Maintenance of Way Association (AREMA) chapter 14 Section 4.4.2.6.1 Track Geometry – Unit Trains for Guidance.

3.2 The minimum tangent distance between curves greater than 07° 30' shall be at least one car length (60 feet to 100 feet), no exceptions. For the minimum distance between facing point turnouts use 40 feet as a baseline, shorter distances will require RFTA approval.

3.3 Industry track center minimums are as follows:

a. 15 feet preferred on tangent track.
b. 15 feet if the spur is adjacent to a lead track or on a curve track.
c. 20 feet if the spur is adjacent to a switching lead.
d. 25 feet if the spur is adjacent to a main or branch line track.

3.4 Horizontal curves must not begin on the long ties of a turnout. Shorter ties and interlaced ties behind the frog will not be considered.

3.5 Turnouts: Consultant RFTA prior to design to determine if more stringent design criteria will be required.

UP Standard Drawing No. 345000 - No. 15 turnouts will be required for all unit train operations and at other locations required by RFTA. Installation may or may not require power operation. Mainline turnouts are to be made of 136# rail unless specified and/or approved by RFTA.

UP Standard Drawing 343000- No. 11 turnouts (minimum) are required out of all main tracks and located not closer than 300 ft. to a mainline curve or bridge. Mainline turnouts are to be made of 136# rail unless specified and/or approved by RFTA.

UP Standard Drawing 341000 - No. 9 turnouts are recommended for industrial lead and spur track installation other than main track. Turnouts maintained by RFTA, or the UP in Glenwood area, are to be 136# rail unless specified and/or approved by RFTA (or UP's AVP Engineering – Design/Construction or a designated representative in the Glenwood Easement area).

No. 8, No. 8-1/2 or No. 10 turnouts will be considered where site conditions warrant in lieu of No. 9 turnouts on privately owned and maintained trackage, they must meet the latest edition of the AREMA Manual. Neither RFTA nor UPRR will own or maintain turnouts of these sizes.

All turnouts in RFTA owned or maintained track will be equipped with a new standard switch stand and target supplied by a UP/RFTA approved vendor. Turnouts in RFTA owned or maintained track will be insulated. Type of switch stands to be designated by RFTA for ergonomic and signal application reasons.

If a new turnout is located within 500 feet of a bridge that does not have a footwalk with a handrail on both sides, then its installation will be required. (See **Section 15)**

Any turnout placed within three hundred foot (300') of the edge of a road crossing's surface needs the prior approval of RFTA's engineer.

Transition zones, associated with turnouts, are required on all tracks where maximum authorized speed is 20 MPH or greater.

If turnout is to be Power Operated Turnout (POTO), special ties and components might be required. Power Operated Derails may be required if POTO is used. NOTE: Special ties on Derail components are required if it is Power Operated.

3.6 Stationing of each track should begin with 0+00 at the proposed point of the switch for each new track. (**See Section 2.05**)

4.0 TRACK PROFILE SPECIFICATIONS

4.1 Vertical curves should have a minimum length of 100 feet and be designed for the longest curve practical, with a V/L not to exceed 1.2 for Sags and 2.00 for Summits, in which V = (Grade 1) minus (Grade 2) and L = Length of Curve in Stations. The rate of change V/L = Algebraic difference in grades divided by the length of the vertical curve in 100-foot stations. The track should be designed to

minimize the number of grade changes and use the smallest V/L as practical (The current AREMA Vertical Curve Standard will not be used). For Unit Train Operations, more conservative design criteria may be required. Use the American Railway Engineering and Maintenance of Way Association (AREMA) Chapter 14 Section 4.4.2.6.1 Track Geometry – Unit Trains for Guidance.

4.2 Track Grade shall be designed for the least grade practical, but shall not exceed 2.00%. (1.5% or current local ruling grade on main track segments) Grades on track at the location used for spotting rail cars are not to exceed 0.4%. For Unit Train Operations, more conservative design criteria may be required. Use the AREMA Chapter 14 Section 4.4.2.6.1 Track Geometry – Unit Trains for Guidance.

4.3 Vertical curves must not begin on the long ties of a turnout. The grade from the point of the switch through the long switch ties must be the same as the existing track that the turnout is coming out of.

4.4 Top of the rail of the existing track must be shown for a minimum of 200 feet in prior to the proposed point of the switch and 200 feet from the last long switch tie.

4.5 Description and location of benchmark used in determining elevations.

4.6 All drainage devices including invert elevations will be shown on the profile and referenced to the top of the rail. Show the type and size of the drainage device. (See **Section 7.00**).

4.7 Any underground utility crossings under UPRR owned track(s) (see **Section 6.0**) will be shown and referenced to the top of the rail. Show the type of utility and size of casing/pipeline being crossed by proposed and existing tracks.

4.8 Typical cross section showing subgrade, walkway and ditch details (See Walkway detail and typical AREMA Chapter 1 roadway cross sections).

4.9 Stationing of the proposed track should begin with 0+00 at the proposed point of the switch for each new track.

5.0 CLEARANCE REQUIREMENTS

5.1 Horizontal: The minimum clearance shall be 9 feet at a right angle from the centerline tangent track to nearest obstruction, including car floor height loading docks. Clearances are to be increased (1 1/2") per degree of the curve where the facility is located adjacent to or within 80 feet of a turnout or curve limits (add that distance for 100 feet into the tangent from the end of the curve).

5.2 Vertical: The minimum clearance shall be 23 feet from the top of rail to nearest overhead obstruction (See Clearance Section and please add 6" for normal track maintenance). Please also refer to the Public Utilities Commission 4CCR723-7 Section of this document below for PUC Rules.

For overhead wirelines see the RFTA Clearance Standards and/or refer to current National Electric Safety Code manual for wireline clearances.

In any instance, when either horizontal or vertical clearance(s) is less than those of the Colorado Public Service Commission are, as the case may be, the Industry shall secure necessary approval from the appropriate State Authority, in addition to RFTA, for each impaired clearance. The agreement covering service to the Industry's track will include the specific reference to the substandard clearance involved. When state law requires clearances that are more restrictive, such laws will govern. Please try to avoid impaired clearances at all costs. Impaired Clearance Warning Signs shall be illuminated at night.

5.3 Clearances with respect to installation of loading or unloading facilities for handling Liquefied Petroleum Gas (LPG), anhydrous ammonia, ethanol, or other Hazardous Materials as described under Sec. 172.101-Hazardous Materials Table, of the U.S. Dept. of Transportation's hazardous materials regulations.

Loading and unloading devices should not be closer than 9 feet from the centerline of the tangent track. Loading and unloading tracks, storage tanks and other permanent installations should be governed by the following table:

ACTIVITY	CLASS 3 (Combustible Liquid) CLASS 8 (Corrosive Material) CLASS 9	ALL OTHER CLASSES OF HAZARDOUS MATERIALS
Loading and unloading	50 Feet	100 Feet
Storage of loaded tank cars	25 Feet	50 Feet
Storage in tanks	50 Feet	100 Feet

Exceptions to this clearance will require the approval of RFTA's Board and the local Fire Marshal. Tracks on which tank cars of flammable liquids are spotted must be bonded, protected by insulated joints and grounded in accordance with the current conventional standard for bonding tracks. Such insulated rail joints must not be bridged by rail equipment or other means during transfer operations).

6.0 UNDERGROUND AND OVERHEAD PIPELINE AND WIRELINE CROSSINGS

Please refer to the RFTA Utility Standards and Union Pacific Railroad Web Site: (http://www.uprr.com/reus/pipeline/install/shtml) for specifications for underground and overhead utilities.

7.0 DRAINAGE SYSTEMS

RFTA Hydraulic Design Criteria: A complete hydrology study is required when either additional drainage is added to the UP's right of way, or a drainage structure is being added, removed or its size changed.

7.1 The hydrology study for RFTA owned or maintained track must include, but is not limited to:

a. Top of rail elevation.
b. The 50-year and 100-year water surface elevations for both the existing and proposed conditions.

c. Flow rates for both events.
d. Location map of drainage area including RFTA mileposts and Engr. stations.
e. Size of the drainage area.
f. Location of the water flowing along the right of way.
g. Location where the water leaves the right of way.

7.2 The following RFTA criteria for sizing bridges and culverts on RFTA owned or maintained track is used to determine the adequacy of the existing structure and proposed structure:

a. The 50-year flood elevation should not come into contact with the crown of the culvert or the low chord of the bridge whichever is applicable.
b. The 100-year flood elevation should not exceed the track subgrade elevation at the structure.
c. Both RFTA's criteria and local criteria (+ FEMA) shall be evaluated, and the more restrictive shall be adopted in sizing the drainage structure or replacement.
d. If the existing structure opening more than satisfies the foregoing criteria, a smaller section which satisfies the criteria set forth above may be recommended.
e. Minimum culvert size allowed under RFTA owned or maintained track is 30".
f. The use of any drainage culverts other than annular corrugated steel (CSP) will require prior approval by RFTA before installation.
g. The use of elliptical or arch pipe is strictly prohibited.

7.3 If the existing bridge or culvert does not meet the design criteria, an enlarged opening will be considered. To the extent possible, this enlargement will be made laterally. If it is found that the criteria cannot be met with maximum widening, RFTA will be contacted to discuss consideration of relief bridges on the overbank floodplain, raising track grades, or other alternatives which should be evaluated. All structures shall be designed, at a minimum, to meet the latest edition of the American Railway Engineering and Maintenance of Way Association (AREMA) Manual. To the AREMA site is www.arema.org. If the bridge structures are in a FEMA designated floodplain, the water surface elevation for a 100-year event shall be determined regardless of line classification.

7.4 The hydrology study for Industry owned or maintained track must include, but not limited to:

a. Top of rail elevation.
b. The 25-year and 50-year water surface elevations for both the existing and proposed conditions.
c. Flow rates for both events.
d. Location map of drainage area including RFTA mileposts and Engr. stations.
e. Size of the drainage area.
f. Location of the water flowing along the right of way.
g. Location where the water leaves the right of way.

7.5 The following RFTA criteria for sizing bridges and culverts on Industry owned or maintained track is used to determine the adequacy of the existing structure and proposed structure:

a. The 25-year flood elevation should not come into contact with the crown of the culvert or the low chord of the bridge whichever is applicable.
b. The 50-year flood elevation should not exceed the track subgrade elevation at the structure.

c. Both RFTA's criteria and local criteria shall be evaluated, and the more restrictive shall be adopted in sizing the drainage structure or replacement.
d. If the existing structure opening more than satisfies the foregoing criteria, a smaller section which satisfies the criteria set forth above may be recommended.
e. Minimum culvert size allowed under RFTA owned or maintained track is 30".
f. The use of any drainage culverts other than annular corrugated steel (CSP) will require prior approval by UPRR before installation.
g. The use of elliptical or arch pipe is strictly prohibited.

8.0 TRACK ROADBED CONSTRUCTION SPECIFICATIONS

These Specifications are to be followed for all construction on RFTA property, for all tracks operated over by UP on RFTA and as a guideline for all other construction. The term Engineer used in this section is defined as the RFTA Engineer or designated consultant or other RFTA authorized representative. For any specifications not covered here, please contact the RFTA Assistant Director, Project Management & Facilities Operations, or his/her designee.

8.1 SAFETY AND HEALTH - At all times during the performance of the Work, the Industry shall exercise precaution for the protection of persons and property. The safety provisions of applicable laws, building, and construction codes shall be observed. Machinery, equipment, and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America; to the extent, such provisions are not inconsistent with applicable law or regulations. Also, see **Section 1.0** "Minimum Safety Requirements for Industry's contractor (s). Entering RFTA Property" contained in this document.

8.2 FIRE PROTECTION - Only work procedures which minimize fire hazards to the extent practicable shall be used. Combustible debris and waste materials shall be collected and removed from the site each day. Fuels, solvents, and other volatile or flammable materials shall be stored in separate areas as well- marked, safe containers. Good housekeeping is essential to fire prevention and shall be practiced by the Industry throughout the construction period.

The Industry shall follow the recommendations of the Associated General Contractors of America's "Manual of Accident Prevention in Construction" regarding fire hazards and prevention.

8.3 SECURITY - The Industry shall be responsible for all materials and equipment in its custody or placed in construction by it. Security methods shall be employed as required to ensure the protection of RFTA Property, of all materials, equipment, and construction work from theft, vandalism, fire, and all other damage and loss.

8.4 UTILITIES – The Industry has the responsibility to locate and protect all utilities on UP property within the limits of construction.

Please note that fiber optic cable systems may be buried on RFTA Property within the limits of this project. UP's Telecommunications Operation Center must be contacted at 1-800-336-9193 prior to construction along with 811 (UNCC).

8.5 CROSSINGS - Except as authorized by RFTA, the Industry/Applicant will not construct crossings over any track at any location on RFTA property. Where crossings are needed or desired, the Industry shall make arrangements directly with the RFTA Assistant Director, Project Management & Facilities Operations Director, or his/her designee. If a crossing or crossings are required to complete the Work as set forth in the Specifications, the Drawings, and the Agreement, such crossings shall be constructed by RFTA unless the RFTA specifically authorizes the Industry/Applicant to construct such crossings.

8.6 ACCESS ROADS - Industry shall ensure that any access roads used by the Industry/Applicant or their contractor on RFTA property are maintained during construction and left in pre-construction condition when the project is complete.

Access roads and parking areas which the Industry needs to construct on the RFTA's Right of Way or property, which the UP or RFTA has easement or interest in, shall be approved by RFTA' before such roads or parking areas are built. All access roads and parking areas constructed by the Industry that RFTA deems unsuitable for the future UP or RFTA use shall be removed at Industry/ Applicant expense upon completion of the Work. The areas shall be stabilized with gravel or put back to preexisting conditions where required.

8.7 DUST CONTROL - Industry shall provide equipment for dust control during construction to provide for the safety of RFTA personnel and RFTA rail and non-rail operations.

8.8 CLEAN UP - Upon completion of work, the Industry shall clean the location of the Work and all ground on RFTA property occupied by him in connection with the Work. The Industry shall remove all rubbish; excess materials, temporary structures, and equipment, leaving the location of the Work cleaned to the satisfaction of RFTA.

8.9 ROADBED WIDTH - Roadbeds shall be constructed per UP's Engineering Standard or AREMA Chapter 1 Guidelines, whichever is more restrictive**.** On RFTA owned or maintained tracks, a twenty-four-foot roadbed will be required. Although a twenty-four-foot roadbed is preferred, tracks not owned or maintained by RFTA may have a twenty-two-foot roadbed (with permission of RFTA's Engineer). Additional roadbed width will be required along all turnouts and derails to provide adequate room for placement of walkways.

8.10 CONSTRUCTION PAD - Industry shall provide a construction pad adjacent to the location where a turnout will be installed in UPRR or RFTA track. The pad should be sufficiently sized to facilitate the assembly and installation of the turnout. At the direction of RFTA or UP, the pad may have to be removed to facilitate proper drainage after the switch is installed. Construction Pad details should be included with the Construction Plans.

8.11 CLEARING AND GRUBBING - Areas required for embankment or excavation shall be cleared and grubbed. On areas required for excavation, all stumps, roots, etc., shall be removed to a minimum depth of two feet (2') below the subgrade elevation. On areas required for the embankment, all stumps, roots, etc., shall be removed to a minimum of two feet (2') below the existing ground. All holes remaining after clearing and grubbing shall be backfilled and compacted and the entire area bladed to provide drainage, except, in areas to be immediately excavated, RFTA may direct that the holes not be backfilled. On areas required for borrow sites and material sources, all stumps and roots, (except for designated trees and shrubs) shall be removed to prevent such objectionable matter becoming mixed with the material to be used inconstruction.

Areas requiring minimal grubbing, as designated by RFTA, shall have a minimum of six inches (6”) of vegetation and topsoil removed from the construction area.

All cleared and grubbed material shall be either:

a. Stockpiled to be used as topsoil after grading is complete if RFTA has approved the material for this use.
b. Properly disposed of in a manner satisfactory to RFTA and in compliance with Federal, State, and Local regulations.

Some existing RFTA embankment slopes are very steep (1.5’: 1’ or less). These slopes cannot be cleared and grubbed along with the foundation of embankment areas. These slopes must be cleared in steps (see Section 8.14, last paragraph) immediately ahead of placing embankment lifts and the cleared material wasted over the side of the new embankment. No steps will be left uncovered overnight.

8.12 UNSUITABLE MATERIALS - If unsuitable materials are encountered below the foundation of embankments, below subgrade elevation in excavation areas, or in the excavated material to be used in embankments, such materials shall be disposed of properly.

Unsuitable material removed from below subgrade elevation in excavation areas and from under embankment foundations shall be replaced to proposed grade elevation with suitable materials, compacted to specification.

RFTA shall identify such unstable materials, the limits of removal, and shall approve the replacement material.

8.13 EXCAVATION - Before excavation begins, the area shall be cleared and grubbed (see **Section 8.9**). The Industry shall perform all excavation to the elevations and grades shown on the Drawings and as a stake in the field. This work shall consist of excavating the material from roadbed areas, or the borrow areas, and placing the material as the embankment, shaping and sloping necessary for the construction, preparation, and completion of roadbeds and other earthworks.

The Industry shall excavate all materials including rock and common materials that must be removed to accomplish the excavation as shown on the Drawings. All excavated materials will be used in the formation of embankments, roadbeds, and other earthworks so long as such excavation material is satisfactory for such use**. Materials must be tested by an independent testing laboratory and/or approved by RFTA prior to placement.**

Where excess excavation materials or unsatisfactory material exists, such materials will be disposed of in areas on the Right of Way, approved by RFTA, or off the Right of Way in a legal and proper manner. Industry shall provide RFTA with a copy of agreements made with any landowner.

Excavation shall be done in a manner and sequence that will provide proper drainage at all times.

No blasting will be allowed without sufficient advanced notice given to RFTA. This time will permit the safe and continuous operation of the RFTA.

The Industry shall construct intercepting ditches above the cut slopes where natural ground slopes toward the track (see AREMA Chapter 1, "Roadway"**).**

After the cut has been completed, the Industry shall scarify the top six inches (6") of material below the top of proposed subgrade, adjust moisture content, and compact such scarified material (see **Section 8.15).**

In cut sections where the material to be excavated is solid rock, the Industry shall excavate twelve inches (12") below the subgrade elevations as shown on the Drawings and such excavated twelve inches (12") of solid rock with embankment material approved by RFTA. These twelve inches (12") of embankment shall have the moisture content adjusted and be compacted to specifications (see Section **8.15**).

8.14 EMBANKMENT - Embankments shall be constructed and compacted to the elevations and grades set forth in the Drawings and as a stake in the field.

After the required clearing and grubbing, the foundations for embankments shall be prepared by scarifying the top six-inch (6") layer of existing ground, adjusting moisture content, and compacting such scarified material (see **Section 8.15**).

If the quantity of materials required for construction of embankments exceeds the number of materials removed from excavation necessary to complete the project, additional embankment material will be obtained by:

a. Widening cuts in the grading area. The Industry shall consult with RFTA before widening any cuts. Cuts shall be cleared and grubbed and widened in such a manner as to:
    1. Be at least as stable as the original cut
    2. Provide adequate drainage for the roadbed
    3. Retain the same, or lesser degree of, slope lines as original cut
b. Establishing borrow areas within the right-of-way, if available, or from areas outside of the right-of-way, provided by the Industry, to obtain the additional embankment materials. All borrow areas shall be cleared and grubbed.

<u>All imported materials shall be clean and free of any contaminants and hazardous materials. Materials are to be tested at the source by the Industry and approved by RFTA prior to placement. Copies of laboratory tests are to be given to RFTA.</u>

The Industry shall not place any material that is to be used in the construction of an embankment on top of a frozen surface. With the prior approval of RFTA, the Industry shall remove all layers of frozen ground and frozen materials in order to prepare a proper foundation for the construction of embankments. Furthermore, the material being placed for embankment shall contain no frozen material.

Wherever an embankment is placed on or against an existing embankment, the existing embankment side slope will be cut in steps to tie the new embankment into the existing side slope. These steps should not be over one foot (1') vertically and cannot be cut until the embankment material will be placed immediately following the cutting of these steps. **No steps will be left uncovered overnight.**

MOISTURE AND DENSITY REQUIREMENTS - In cut sections, after cut has been completed, the Industry shall scarify the six inches (6”) of material below the top of proposed subgrade, adjust moisture content and compact the scarified material to a dense and unyielding condition and to a minimum of 95% (Modified Proctor) of maximum density. **After cut sections are excavated to subgrade, scarified and re-compacted RFTA shall observe and approve (by proof rolling or other methods) these areas before any subballast is placed.**

In cut sections where the material to be excavated is solid rock, the Industry shall excavate twelve inches (12”) below the Subgrade elevations as shown on the Drawings. The Industry shall replace such excavated twelve inches (12”) of solid rock with embankment material approved by RFTA, adjust the moisture content of this material and compact to a dense and unyielding condition and to a minimum of 95% (Modified Proctor) of maximum density.

After the required clearing and grubbing, the foundations for embankments shall be prepared by scarifying the top six-inch (6”) layer of existing ground, adjusting moisture content, and compacting such scarified material to a dense and unyielding condition and to a minimum of 95% (Modified Proctor) of maximum density. **After the foundation, areas are scarified and re-compacted RFTA shall observe and approve (by proof rolling or other methods) these foundation areas before any embankment material is placed.**

Embankments and backfills of less than three-foot (3’) of fill shall be compacted to a dense and unyielding condition and to a minimum of 95% (Modified Proctor) of maximum density.

When embankments and backfills are composed of more than three-foot (3’) of fill, the materials within three feet (3’) of the established subgrade (top of fill) elevation shall be compacted to a dense and unyielding condition and to a minimum of 95% (Modified Proctor) of maximum density. The material below said three-foot (3’) from subgrade (top of fill) elevation shall be compacted to not less than 90% of maximum density.

Unless otherwise directed by RFTA, the moisture content of the soil at the time of compaction shall be at the optimum moisture content or within minus four percentage points (4%) of the optimum moisture content as stated in ASTM D 1557 Modified and as determined by tests taken by RFTA in accordance with ASTM standards.

Each embankment lift shall be tested for compaction compliance before the next lift is placed.

All compaction shall be determined using ASTM D 1556 for field tests and ASTM D 1557 for moisture and density.

Copies of all soils tests and observations shall be provided to RFTA, RFTA will not approve placing subballast before these tests are received.

8.15 FINISH GRADING - The Roadbed shall be finished to the lines and grades shown on the Drawings and as staked. The Industry shall protect finished roadbeds from damage, from all causes, until accepted by the RFTA.

Blue Tops (finished grade stakes) are required at one hundred-foot (100’) intervals and are to be set at the shoulders and at the centerline. If the distance between the shoulder stake and the centerline stake is

over one hundred foot (100'), an intermediate Blue Top will be required.

8.16 TOPSOIL - A minimum of six inches (6") of topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from the subsoil, roots, heavy or stiff clay, stones larger than two inches (2") in greatest dimension, noxious weeds, sticks, brush, litter, and other deleterious matter will be placed on all excavation and embankment slopes and any disturbed soils that will not support plant life and/or will cause or allow soil erosion. After placement of topsoil, all slopes over three-foot (3') high shall be cat walked.

8.17 SLOPE PROTECTION AND EROSION CONTROL - This work shall consist of installing silt fence and ditch checks for controlling stormwater erosion during construction. A copy of the Industry/ Applicant's Storm Water Pollution Prevention Plan will be given to RFTA before the beginning of construction.

8.18 SEEDING - This work shall consist of the preparing and seeding roadbed slopes, disturbed areas, and areas designated by RFTA. The areas involved will be comprised of cut and fill slopes and other areas disturbed by the construction, exclusive of rock slopes. Seedbed preparation, seeding rates, and mixtures, fertilizer rates, and mulching requirements shall conform to the state DOT specification for the region.

8.19 RIPRAP - Riprap shall be hard, durable, and angular in shape and shall be free of cracks, seams, expansive materials or other defects that would cause accumulated deterioration from exposure to climatic conditions.

RIP RAP CLASS	AVERAGE WEIGHT PER STONE (LBS.)	DIMENSION (INCHES)	LAYER THICKNESS	TYPICAL VELOCITIES
I II	50 to 200 400 to 1,000	9 to 14 17 to 24	1'-6" 2'-0"	6 – 8 fps 8 – 12 fps
III	1,000 to 4,000	24 to 38	3'-0"	> 12 fps
IV	> 4,000	> 38	4'-0"	SPECIAL CASES

RFTA shall specify the Class of riprap. Riprap shall be placed in such a manner as to avoid segregation of various sizes of rock and distributed so that there will be no large accumulation of either the larger or smaller sizes of stone. Individual rocks shall be placed in tight contact with one another in such a way as to produce the least amount of void spaces and providing adequate embankment protection and erosion control. The entire mass of riprap shall be well distributed within the limits specified. However, the following allowances shall be acceptable to produce the required riprap protection:

Riprap Class I	No allowances are permitted
Riprap Class II	15% of Riprap Class I
Riprap Class III	15% of Riprap Class I and 15% of Riprap Class II
Riprap Class IV	15% of Riprap Class I, 15% of Riprap Class II and 15% of Riprap Class III

8.20.1 CULVERTS – CORRUGATED STEEL AND CORRUGATED ALUMINUM ALLOY

These pipe culvert specifications cover the assembly and installation of:

a. Corrugated Steel Pipes - (CSP)
b. Corrugated Structural Plate Pipe - (SPP)
c. Corrugated Aluminum Alloy Pipe - (CAAP)

The above are hereinafter referred to as "pipe culverts". Pipe culverts shall be assembled and installed in accordance with these Specifications and Chapter 1, Part 4 of the current American Railway Engineering and Maintenance of Way Association (AREMA) Specifications for culvert installation. The most restrictive provisions shall govern when there are differences in the requirements.

8.20.2 PIPE CULVERT MATERIAL - All pipe culverts will be furnished with annular corrugations and the exposed ends of all corrugated pipes shall be square. 3" x 1" annular corrugations shall be used for all CSP pipes with 36" diameters and larger; 2-2/3" x 1/2" or 3" x 1" annular corrugations shall be used for 30" diameter CSP pipes. 3" x 1" annular corrugations shall be used for all CAAP pipes. CSP and CAPP material furnished by the Industry, must meet the standards for pipe culverts set forth in Chapter 1, Part 4 of the current AREMA Manual for Railway Engineering, or as required and approved by RFTA. 6" x 2" annular corrugations and a Minimum of 4 bolts per foot shall be used for all SPP pipes. SSP material and connecting material shall be per the current AREMA Manual of Railway Engineering, chapter 1, part 4, Section 6. Any deviations of these Specifications are to be submitted to RFTA for approval prior to starting construction.

8.20.3 HANDLING OF PIPE CULVERT MATERIAL - The Industry shall handle pipe culverts and the pipe culvert material carefully in order to prevent damage, including, but not limited to, distortion of the pipes, and injury to bituminous and other pipe culvert coatings. Pipe culverts shall never be dragged over the ground, but shall be handled with skids, rolling slings, or cranes. The Industry shall promptly repair, to the satisfaction of RFTA; any damage to the pipe culvert or pipe culvert material. In the event such damaged pipe culverts or pipe culvert material cannot be repaired to the satisfaction of RFTA, replacement pipe culverts or pipe culvert material must be provided by the Industry.

8.20.4 EXCAVATION AND LOCATION - Pipe culverts shall be placed in excavations at the location, elevation, and alignment shown on the Drawings and as staked. The Industry shall preserve all stakes until pipe culvert installation is complete.

Prior to pipe culvert excavation, embankment must be constructed to a height no less than two feet (2') above the top of the proposed pipe culvert. When embankment is placed, alternate methods may be used if approved by RFTA. Pipe culvert excavations shall be wide enough to permit thorough compaction of the backfill under and around the pipe culvert as required by **Section 8.21.10**. The BASE WIDTH of the pipe culvert excavation shall not exceed the external width of the pipe culvert plus:

a. 12 inches on each side for pipes less than 48 inches in diameter
b. 18 inches on each side for pipes 54-78 inches in diameter

c. 24 inches on each side for pipes 84 inches in diameter or larger

Pipe culvert excavation shall be deep enough to permit compliance with **Section 8.21.05**. Care shall be taken to insure drainage is diverted away from the pipe bed during preparation. The Industry shall repair any damage to, or deterioration of, pipe bedding prior to installation, to the satisfaction of RFTA.

The Industry shall comply with all current and applicable Federal, State and local rules and regulations governing the safety of men and materials during pipe culvert excavation, installation and backfilling operations.

The Industry shall observe requirements of the Occupational Safety and Health Administration relating to excavations, trenching and shoring as set forth in Title 29, Part 1926, Subpart Paragraph P, and Sections 1926.650 through 1926.653, Code of Federal Regulations, and any subsequent revisions. See also **Section 8.21.04** below.

8.21.4 SHORING - When working near UP or RFTA tracks, temporary shoring may be required. UP's "Guidelines for Temporary Shoring" can be found on the Internet at: http://www.uprr.com/aboutup/operations/specs/index.shtml.

Before beginning any work that would require shoring, as determined by the above standards, the Industry shall provide detailed plans of the intended shoring. If the shoring falls within Zones A or B, the plans shall include design calculations. Plans and calculations must be signed and stamped by a Professional Engineer; licensed in the state the work will be done.

8.21.5 FOUNDATION, BEDDING, AND COMPACTION - Pipe culverts shall be placed at the flowline grade and elevation established by the Drawings and Specifications on a uniform bed of stable earth or granular material such as gravel or sand, and such bedding shall be compacted to not less than 95% (Modified Proctor) of maximum density determined by ASTM D 1557 with moisture content adjusted. The compacted bed shall contain the camber required by RFTA or as covered by the Specifications listed below in **Section 8.21.06**. Where the granular material is used for bedding, the ends of the pipe culvert in embankment shall be sealed to prevent leaking and infiltration of water along the pipe culvert. Such sealing can often be accomplished by blanketing the ends of the pipe culvert embankment with well-tamped clay. In all cases, the ends of pipe culverts shall be protected by riprap as outlined in **Section 8.21.07.**

Where the flowline grade crosses areas of soft soil, which will not provide a suitable uniform foundation for the pipe culvert bed, the Industry shall excavate eighteen inches (18") below the flowline grade for a width equal twice the outside width of the pipe culvert. Prior to backfilling, RFTA shall inspect the excavation and the Industry shall perform any additional excavation required by RFTA. Upon completion of the excavation, the Industry will backfill such excavation with granular material which shall be compacted and tested as required.

When the flowline grade passes over rock, the Industry shall excavate such rock to a depth, which is at least twelve inches (12") below the flowline grade. Excavations in rock shall maintain sufficient area so that the pipe culvert will not rest on a rock at any point. The Industry will backfill excavation in rock with granular material which shall be compacted and tested as required.

8.21.6 CAMBER - Camber shall be placed in all culverts where it is anticipated that the culvert will settle as the result of high embankment construction or compressible foundation soils below the culvert bedding. Unless otherwise specified by RFTA, all culverts shall be cambered in accordance with the following:

a. The culvert shall not be cambered so high in the center that water will be pocketed at the inlet end of the pipe.
b. Culverts resting on rock foundations need not be cambered, refer to **Section 8.21.04**, last paragraph.
c. Embankments up to 8 feet high (measured base of rail to flowline) require a 1-1/2-inch camber.
d. Embankments 8 feet to 12 feet high require a 2 - 1/2-inch camber.
e. Embankments 12 feet to 24 feet high require a 4-inch camber.
f. Embankments 24 feet to 36 feet high require a 6-in. camber.

The above camber standards, based on the height of embankments, may be adjusted in the field, where at the discretion of RFTA a greater or lesser amount of camber should be built into the pipe to adjust for soil conditions encountered at the site. For fills higher than 36 feet, RFTA or its designated consultant will provide the camber requirements.

8.21.7 RIPRAP PROTECTION - Both the inlet and outlet end of all culverts shall be protected by riprap to RFTA's satisfaction. (AREMA or UP Standard to be applied, case dependent)

8.21.8 ASSEMBLY - Pipe culverts shall be joined with locking coupling bands in accordance with the provisions of the AREMA Manual for Railway Engineering Chapter 1, Part 4, Section 4.3.4. Coupling bands shall be of the same base material and finish as the pipe. Coupling bands for thirty inch (30") or larger culvert pipe shall be two foot (2') wide. The inside of the corrugated coupling bands and the outside of pipe culverts to be joined by corrugated coupling bands shall be kept clean and free of all dirt or gravel to ensure that the corrugations on the coupling bands and the pipe culvert fit snugly as the coupling bands are tightened. They should be tapped with a mallet or hard rubber hammer to ensure a tight joint. Coupling bands and the outside surface of the culvert pipe under the coupling bands often need to be lubricated with fuel oil or similar solvent to allow the coupling bands to be drawn firmly into place.

Corrugated structural plate pipe shall be assembled in accordance with the manufacturer's detailed assembly instructions. Bolts shall be tightened progressively and uniformly, starting at one end of the corrugated structural plate pipe after all plates are in place. Tightening shall be repeated to ensure all bolts are tight.

When a power wrench is used for tightening bolts, the Industry shall check the tightening of the bolts with one handled structural or socket type torque wrench. Bolts shall be torqued uniformly to a minimum of 100 ft. lb. and a maximum of 300 ft. lb. or as specified in the manufacturer's detailed assembly instructions.

Where field cutting of culvert pipes is required, the Industry shall make saw cuts, torch burning will not be permitted.

8.21.9 LAYING CULVERT PIPE - Installation of culvert pipe shall conform to the current AREMA Manual for Railway Engineering, Chapter 1, Part 4 for CSP and for SPP. Each pipe culvert shall be laid true to the flowline grade. The minimum gradient for any pipe culvert shall be zero-point five percent

(0.5%) or as directed by RFTA. If two or more pipe culverts are to be laid parallel to each other, such parallel pipe culverts shall be spaced to permit thorough compaction of the backfill as required by **Section 8.21.10** below. Parallel culverts shall be separated by a distance of at least one-half (1/2) of the nominal diameter of the pipe culverts, but not less than twelve inches (12") nor shall it exceed forty-eight inches (48"). Riveted corrugated metal pipe culverts must be placed with the inside circumferential laps pointing downstream. The Industry/Applicant shall cover exposed metal on the surface of any bituminous coated pipe culvert before backfilling is commenced. Such exposed metal must be covered with a material which is approved by RFTA and which includes:

a. Fiber Bonded Bituminous (composite) coating ASTM A-825 (steel only)
b. Polymeric Coating - ASTM A762 or AASHTO M245 (steel only)
c. Galvanized - AASHTOM218 or Aluminum (Type 2) - AASHTO M274 (steel only)
d. Asphaltic Coating - AASHTO M190 (steel and aluminum) (only 3 and 4 for structural plate pipe)

Such material shall be applied to a thickness of approximately one-sixteenth (1/16) of an inch.

All pipe culverts with a nominal diameter of 48 inches or greater shall be provided with a five percent (5%) vertical elongation. Field strutting shall be required only on very large structural steel pipes, ten foot (10’) or greater, or as specified on Drawings or Specifications.

8.21.10 BACKFILLING AND COMPACTION - Backfill materials shall be placed simultaneously on both sides of the pipe culvert in uniform layers not to exceed six inches (6") in thickness. For multiple pipes, the backfill shall be placed simultaneously in uniform six inches (6”) layers between and outside of pipes. Each successive layer shall be compacted to not less than 95% (Modified Proctor) of maximum density as determined by ASTM D 1557 with moisture content adjusted if necessary, and each six-inch (6”) layer shall be properly compacted before the next layer is placed.

Backfilling shall be started and completed as quickly as possible after the pipe culvert has been assembled and placed on its bed.

Special care must be taken to obtain adequate compaction under the pipe culvert haunches; however, care must be exercised to avoid lifting of the pipe culvert as the result of tamping to compact material under the haunch. Where pipe culvert is placed in a confined area, making it difficult to obtain adequate compaction under the pipe culvert haunches though tamping, a Controlled Low-Strength Material (CLSM) fill may be used.

All backfilling material placed around and adjacent to pipe culverts and to a point at least one foot above the top of the pipe culvert shall consist of sand, gravel, sandy clay, or a combination thereof, free from all vegetation and rock or lumps greater than one and one-half inches (1-/2”) diameter in their greatest dimension. Granular material containing a small amount of silt or clay is an ideal backfill material because it makes a dense, stable fill.

Where granular material is used for backfill, the ends of the pipe culvert embankment shall be sealed with well-tamped clay to prevent leaking and infiltration of water along the pipe culvert.

Materials used to complete the embankment over the pipe culvert should be essentially the same as the materials used for the pipe culvert backfill and should be placed and compacted in the same manner as pipe culvert backfill materials are placed. Such material must be used to complete the embankment at least to a height over the top of the pipe culvert equal to the nominal diameter of the pipe culvert, or if

the height of the completed embankment over the top of the pipe culvert is less than the nominal diameter of the pipe culvert, then such material must be used to complete the embankment. The pipe culvert must be protected from damage during the entire construction period, especially if heavy compaction and/or construction equipment is used. Heavy equipment shall not be operated over the pipe culvert until it has been covered with compacted backfill material to a depth of twenty-four inches (24"). **Copies of all compaction tests shall be supplied to RFTA.**

8.21.11 RETIGHTENING OF BOLTS - As soon as possible after completion of the embankment over corrugated structural plate pipes, all bolts in the corrugated structural pipe must be retightened to the standards set forth in **Section 8.21.08** above. Such retightening must be started at one end of the pipe culvert and all bolts must be tightened progressively through the length of the pipe culvert.

8.21.12 REMOVAL OF EXISTING HEADWALLS OR CULVERTS IN PREPARATION FOR EXTENSION OF EXISTING PIPE CULVERTS - The shall remove existing headwalls and/or culverts in whole or in part as shown on the Drawings and in the Specifications. The Industry shall perform all work called for, as shown on the Drawings and in the Specifications, which may be necessary to adapt existing pipe culverts for extension or reconstruction, including required excavation and backfilling. Except as otherwise provided for in these Specifications, the Industry will determine the method of extending existing pipe culvert structures by consulting with RFTA. See also **Section 8.21.04**.

8.22 CULVERTS - REINFORCED CONCRETE PIPE (RCP)

These pipe culvert specifications cover the fabrication and installation of:

a. Round reinforced concrete pipes
b. Reinforced concrete manhole riser
c. Reinforced concrete flared end pipes

Each of which will be referred to as "pipe culverts". Pipe culverts may be for culverts, siphons, drains, and conduits as shown on the Plans or directed by RFTA in accordance with these Specifications and in all accordance with Chapter 8, Part 10 of the current AREMA Specifications for culverts. The most restrictive provisions shall govern when there are differences in the requirements.

8.22.1 PIPE CULVERT MATERIAL - Pipe culvert material must meet the standards set forth in Chapter 8, part 10 of the current AREMA Specifications. RCP pipe culvert materials shall be furnished in lengths not less than 4 feet. The material is to be new material. All pipe material shall be designed for Cooper E80 loading and no pipe lighter than Class IV will be permitted. The minimum factor of safety against the formation of a 0.01-inch crack shall be 1.0. In lieu of design analysis, the Industry may furnish Class V pipe for installations with 14 feet maximum cover.

8.22.2 HANDLING OF PIPE CULVERT MATERIAL - The Industry shall handle pipe culverts, and the pipe culvert material, carefully in order to prevent damage including, but not limited to, injury to pipe culvert coatings, chipping or breaking culvert ends. The pipe culverts shall never be dragged over the ground but shall be handled with skids, rolling slings, or crane. The Industry shall promptly repair, to the satisfaction of RFTA; any damage to the pipe culverts or culvert material which the Industry causes. In the event that such damage to culverts or pipe culvert material cannot be repaired to the satisfaction of RFTA, replacement of pipe culvert and/or pipe culvert material must be provided by the Industry.

8.22.3 EXCAVATION AND LOCATION - Pipe culverts shall be placed in excavations at the location, elevation, and alignment shown on the Drawings and as staked. The Industry shall preserve

all stakes established until installation is complete.

Prior to pipe culvert excavation, embankment must be constructed to a height no less than two feet (2') above the top of the proposed pipe culvert. When embankment is placed, alternate methods may be used if approved by RFTA. Pipe culvert excavations shall be wide enough to permit thorough compaction of the backfill under and around the pipe culvert as required by **Section 8.22.10**. The BASE WIDTH of the pipe culvert excavation shall not exceed the external width of the pipe culvert plus:

a. 12 inches on each side for pipes less than 48 inches in diameter.
b. 18 inches on each side for pipes 54-84 inches in diameter.
c. 24 inches on each side for pipes 84 inches in diameter or larger.

Pipe culvert excavations shall be deep enough to permit compliance with **Sections 8.22.05**. Care shall be taken to ensure drainage is diverted away from the pipe bed during preparation. The Industry shall repair any damage or deterioration of, pipe bedding prior to installation, to the satisfaction of RFTA.

The Industry shall comply with all current applicable Federal, State, and local rules and regulations governing the safety of men and materials during pipe culvert excavation, installation, and backfilling operations.

The Industry shall comply with all requirements of the Occupational Safety and Health Administration relating to excavations, trenching and shoring as set forth in Title 29, Part 1926, Subpart Sections 1926.650 through 1926.653, Code of Federal Regulations, and any subsequent revisions. See also **Section 8.22.04** below.

8.22.4 SHORING - When working near UP or RFTA tracks, temporary shoring may be required. UP's "Guidelines for Temporary Shoring", a good example of proper shoring protection, can be found on the Internet at:
http://www.uprr.com/aboutup/operations/specs/index.shtml.

Before beginning any work that would require shoring, as determined by the above standards, the Industry shall provide detailed plans of the intended shoring. If the shoring falls within Zones A or B the plans shall include design calculations. Plans and calculations must be signed and stamped by a Professional Engineer; licensed in the state the work will be done.

8.22.5 FOUNDATION, BEDDING, AND COMPACTION - Pipe culverts shall be placed at the flowline grade and elevation established by the Drawings and Specifications on a uniform bed of stable earth or granular material such as sand or gravel. Such bedding shall be compacted to not less than 95% (Modified Proctor) of maximum density as determined by ASTM D 1557, with moisture content adjusted as necessary. The compacted bed shall contain the camber required by RFTA or as covered by the Specifications listed below in **Section 8.22.06**. The compacted bed shall be shaped to fit the bottom of the pipe and shall conform to Class A, B or C bedding (see Table 10.33.4 bedding factors) AREMA Specifications chapter 8-10. Where granular material is used for bedding, the ends of the pipe culvert excavation shall be sealed to prevent leaking and infiltration of water along the pipe culvert. Such sealing can often be accomplished by blanketing the ends of the pipe culvert embankment with well-tamped clay. In all cases the ends of pipe culverts shall be protected by riprap as outlined in **Section 8.22.07**, this plan refers to steel pipe but the riprap section shall also apply to the concrete pipe.

Where the flowline grade crosses areas of soft of soil, which will not provide a suitable uniform foundation for the pipe culvert bed, the Industry shall excavate eighteen inches (18") below the

flowline grade for a width equal to twice the outside width of the pipe culvert. Prior to backfilling, RFTA shall inspect the excavation and the Industry shall perform any additional excavation required by RFTA. Upon completion of the excavation, the Industry will backfill such excavation with granular material, which shall be compacted and tested as required.

When the flowline grade passes over rock, the Industry shall excavate such rock to a depth which is at least six inches (6”) below the flowline grade. The pipe culvert will not rest on a rock at any point. The Industry/ Applicant will backfill excavations in rock with granular material, which shall be compacted and tested as required.

8.22.6 CAMBER - Camber shall be placed in all culverts where it is anticipated that the culvert will settle as the result of high embankment construction or compressible foundation soils below the culvert bedding. Unless otherwise specified by RFTA, all culverts shall be cambered in accordance with the following:

a. The culvert shall not be cambered so high in the center that water will be pocketed at the inlet end of the pipe.
b. Culverts resting on rock foundations need not be cambered. Refer to **Section 8.22.05**, last paragraph.
c. Embankments up to 8 feet high (measured base of rail to flowline) require 1-1/2-inch camber.
d. Embankments 8 feet to 12 feet high require a 2-1/2-inch camber.
e. Embankments 12 feet to 24 feet high require a 4-inch camber.
f. Embankments 24 feet to 36 feet high require a 6-inch camber.

The above camber standards, based on the height of embankments, may be adjusted in the field where, at the discretion of RFTA, a greater or lesser amount of camber should be built into the pipe to adjust for soil conditions encountered at the site. For fills higher than 36 feet, the AVP Design will provide the camber requirements.

8.22.7 RIPRAP PROTECTION - Both the inlet and outlet end of all culverts shall be protected by riprap. The riprap shall be installed per AREMA Chapter 1 or as shown on the Drawings and Specifications if there is special geotechnical detail.

8.22.8 ASSEMBLY - Pipe may be bell and spigot or tongue and groove unless otherwise specified. When bell pipe is used, a shallow excavation shall be made underneath the bell of sufficient depth so the bell does not rest on the bedding material. Ends of reinforced concrete pipe shall be of such design that when properly laid, they shall have a smooth and uniform interior surface. In areas where the pipe will tend to separate, suitable ties shall be installed.

Joints shall be made with either mortar, grout, rubber gaskets, plastic mastic compounds, or by a combination of these types. Any joint system must be approved by RFTA prior to installation.

In general, mild bends, no more than a fifteen (15) degree change in either vertical or horizontal alignment at fifty-foot (50’) intervals, should be used. Pipes used on curves shall have both ends beveled to provide a smooth curve. In no case shall any pipe end be beveled greater than seven and one-half (7-1/2) degrees, and suitable ties shall be installed. If the resulting gap is less than one inch, the resulting space is to be filled with mortar concrete. For gaps of one inch or greater, a reinforced concrete collar shall be poured around the joint as directed by RFTA.

8.22.9 LAYING CULVERT PIPE - Installation of culvert pipe shall conform to the current AREMA Manual for Railway Engineering, Chapter 1, Part 4, each pipe culvert shall be laid true to the flowline grade. The minimum gradient for any pipe culvert shall be zero-point five percent (0.5%) or as directed by RFTA. If two or more pipe culverts are to be laid parallel to each other, such parallel pipe culverts shall be spaced to permit thorough compaction of the backfill as required by **Section 8.21.10** below. Parallel culverts shall be separated by a distance of at least one-half (1/2) of the nominal diameter of the pipe culverts, but not less than twelve inches (12") nor shall it exceed forty-eight inches (48").

Pipe laying shall begin at the downstream end of the culvert. The bell or groove end of the pipe shall be placed facing upstream. No culvert shall be placed in service until a suitable outlet is provided.

8.22.10 BACKFILLING AND COMPACTION - Backfill materials shall be placed simultaneously on both sides of the pipe culvert in uniform layers not exceeding six inches (6") in thickness. For multiple pipes, the backfill shall be placed simultaneously in uniform layers between and outside of the pipes. Each successive layer shall be compacted to not less than 95% (Modified Proctor) of maximum density as determined by ASTM D 1557, with moisture content adjusted if necessary, and each six-inch (6") layers shall be properly compacted before the next layer is placed.

Backfilling shall be started and completed as quickly as possible after the pipe culvert has been assembled and placed on its bed.

Special care must be taken to obtain adequate compaction under the pipe culvert haunches; however, care must be exercised to avoid lifting of the pipe culvert as the result of tamping to compact material under the haunches. Where pipe culvert is placed in a confined area, making it difficult to obtain adequate compaction under the pipe culvert haunches through tamping, a Controlled Low-Strength

Material (CLSM) fill may be used. All backfill material placed around and adjacent to pipe culverts to a point at least one foot above the top of the pipe culvert shall consist of sand, gravel, sandy-clay, or a combination thereof, free from all vegetation and rock or lumps greater than one and one-half inches (1-1/2") in diameter in their greatest dimension. Granular material containing a small amount of silt or clay is an ideal backfill material because it makes a dense, stable fill. Where granular material is used for backfill, the ends of the pipe culvert embankment shall be sealed with well-tamped clay to prevent leaking and infiltration of water along the pipe culvert.

Materials used to complete the embankment over the pipe culvert should be essentially the same as the materials used for the pipe culvert backfill and should be placed and compacted in the same manner as pipe culvert backfill materials are placed. Such material must be used to complete the embankment at least to a height over the top of the pipe culvert equal to the nominal diameter of the pipe culvert, or if the height of the completed embankment over the top of the pipe culvert is less than the nominal diameter of the pipe culvert, then such material must be used to complete the embankment. The pipe culvert must be protected from damage during the entire construction period, especially if heavy compaction and/or construction equipment is used. Heavy equipment shall not be operated over the pipe culvert until it has been covered with compacted backfill material to a depth of twenty-four inches (24"). **Copies of all compaction tests shall be supplied to RFTA**.

8.22.11 REMOVAL OF EXISTING HEADWALLS OR CULVERTS IN PREPARATION FOR EXTENSION OF EXISTING PIPE CULVERTS - The Industry shall remove existing headwalls and/or culverts in whole or in part as shown on the Drawings and in the Specifications. The Industry shall perform all work called for,

as shown on the Drawings and in the Specifications, which may be necessary to adapt existing pipe culverts for extension or reconstruction, including required excavation and backfilling. Except as otherwise provided for in these Specifications, the Industry will determine the method of extending existing pipe culvert structures by consulting with RFTA. See also **Section 8.22.04.**

8.23 CULVERTS - SMOOTH STEEL PIPE (SSP) – JACK AND BORED

These pipe culvert specifications cover the assembly and installation of Smooth Steel Pipe.

Where conditions warrant the installation of pipe culverts by jacking and/or earth boring can be a viable alternative to more standard methods of installation. Smooth Steel Pipe shall be assembled and installed in accordance with these Specifications and Chapter 1, Part 4 of the current AREMA Specifications for culvert installation.

8.23.1 SAFETY - Trenching is one of the most dangerous situations in construction since a jacking operation generally involves some form of trenching or pit construction, the jacking Industry shall strictly conform to all Federal, State, and local regulations and in particular, the requirements of the Occupational Safety and Health Administration (OSHA).

8.23.2 JACKING AND BORING - Pipe boring and jacking operations shall be performed by an experienced specialty Industry normally engaged in performing this type of service. Excavation should not be carried more than a few inches ahead of the pipe. Jacking and boring shall be done continuously to minimize the tendency of the material to "freeze" around the pipe. However, lubricants such as bentonite slurry are available to minimize the freezing tendency.

The borehole diameter shall be essentially the same as the outside diameter of the pipe. Boring operations shall not be stopped if such a stoppage would be detrimental to RFTA. A survey crew shall continually monitor the elevation and alignment of the UP or RFTA track(s) during the jacking procedure, using conventional survey techniques to assure vertical survey precision and if there is track movement work must stop and RFTA immediately notified. The Industry shall submit a corrective action plan to RFTA for his approval and the approved repairs shall be completed as soon as possible.

8.23.3 JACKING AND BORING TOLERANCE - The tolerance from a true line is +/- 2" or less. Adjustments to the line and level shall be gradual to ensure that the pipe manufacture's stated angular deflection is not exceeded.

8.23.4 BORING PIT - The approach trench should be properly sheeted and braced on the sides and working face. Wet sandy soils can be de-watered by various means including good points. **A detailed plan of the bore pit, including shoring proposals, shall be approved by RFTA before the Work is started**. See also **Section 8.21.04**.

8.23.5 FIELD WELDING - Smooth steel pipe sections shall be welded per AREMA Standard. Welders must possess valid certification.

8.23.6 PIPE CULVERT MATERIALS - Smooth steel pipe culvert material shall be in accordance with ASTM International A139. Pipe to be Grade B and steel shall have a minimum yield strength of 35 ksi. Smooth steel pipe shall have welded straight longitudinal seams. The ends of each section of pipe shall be square cut and one shall be suitably beveled for field welding sections together.

8.23.7 RIPRAP PROTECTION - Both the inlet and outlet end of all culverts shall be protected by riprap. The riprap shall be installed per detail in AREMA Chapter 1 specifications or as shown Geotechnical on the Drawings and Specifications.

8.23.8 SMOOTH STEEL PIPE (SSP) - NOT JACK AND BORED - When smooth steel pipe is to be extended, by normal methods, from the end of the jack and bored sections or is placed entirely by normal methods **Sections 8.21.00** through **Sections 8.21.10** shall be followed for any items not specifically covered by **Sections 8.23.00** to **Sections 8.23.06**.

8.23.9 SHORING - When working near UP tracks, temporary shoring may be required. UP's "Guidelines for Temporary Shoring" can be found on the Internet at http://www.uprr.com/aboutup/operations/specs/index.shtml.

8.24 RIGHT OF WAY FENCES AND GATES

The extent of the Standard Right of Way fence and gates is as indicated on the Drawings and Specifications or as designated by RFTA and in accordance with typical details shown in AREMA Chapter 1, Section 6. (Adopted RFTA Standard)

Please refer to the Section 10.0 – FENCING portion of these Design Guidelines and Standards for complete detail on fencing design and construction in RFTA's Corridor.

8.24.1 MATERIALS

Hog tight, woven wire - A twenty-six-inch (26") woven wire galvanized steel fabric is to be used with seven horizontal bars of No. 9 galvanized wire and stays on six inches (6") centers. Weight is approximately 266 pounds per 20-rod roll.

Line Posts - Use painted studded tee steel fence posts seven foot (7') long, with an anchor plate, spaced. Approximate weight 9.98 pounds each.

Corner Post - Use five percent (5%) solution Penta treated wood posts, six inches (6") in diameter by nine foot (9') long or 7" x 9" second-hand wood ties.

Brace Panel Posts - Use five percent (5%) solution Penta treated wood posts, six inches (6") in diameter by nine foot (9') long or 7" x 9" second-hand wood ties.

Horizontal Brace Posts - Use five percent (5%) solution Penta treated wood posts, four inches (4") in diameter or 4" x 4" by nine foot (8') long.

Gate Posts - Use 7" x 9" x 9' second hand ties. Each side of the gate shall have a brace panel constructed to support gate.

Barbed Wire - Shall be two-strand 12.5 galvanized wire, twisted, with 14-gauge 4-point barbs spaced not more than 5 inches center to center. Metal and finish to match fabric (galvanized).

Diagonal Tie Wire - Use double number 8 galvanized steel wire twisted. Wire Clips

- Use 12-gauge galvanized wire clips.

Wire Staples - Use 1.5-inch 9-gauge galvanized steel wire stapes.

Gates - Gate frames shall be constructed of 1.625 in. diameter steel tube with a .066 wall. Rails shall be high strength 16-gauge S-bend shape. Stays shall be roll-formed 12 gauge welded in pairs. Latch shall be double pin 1/2" x 1" steel with lock and saddle horse type handle. Hinge shall be full wrap omega style 1/4' steel with the bottom in fixed position and top will adjust vertically 5" between rails.

8.24.1 INSTALLATION

Do not begin installation and erection until timely notice has been given to RFTA. The area along with the fence line shall be cleared enough to permit proper construction. The fence shall be installed per the Drawings and Specifications.

9.0 INDUSTRY SUBBALLAST/BASE MATERIAL REQUIREMENTS

9.1 **Subballast** - This item shall consist of a foundation course for AREMA Standard or Union Pacific Railroad (UP) ballast and shall be constructed in one or more courses in conformity with the typical sections shown on plans.

9.2 **Material Requirements** - Materials shall be 100% crushed stone produced from oversized quarried aggregate, sized by crushing naturally occurring single source. Aggregate retained on a No. 10 sieve shall consist of hard, durable particles or fragments of stone. The subballast material shall have:

a. No more than approximately 10% freeze-thaw loss when tested in accordance with ASTM C 88-90, Standard Test Method for Soundness of Aggregate by Use of Sodium Sulfate (under 5 cycles of freeze-thaw with sodium sulfate solution)
b. No more than 50% loss when tested in accordance with ASTM C 131-89, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

Industry's Contractor shall provide certification that the subballast/base material meets UP's Specifications.

9.3 **Gradation** - Subballast shall consist of gradations as set forth in AREMA Chapter 1.

9.4 **Design Requirements -** Subballast and its minimum depth are set forth in AREMA Chapter 1.

10. 0 TRACK MATERIAL

10.1 **Rail** - 112 lb. to 141 lb. relay rail is required. Rail must meet or exceed AREMA Class Specifications if greater than three hundred (300) per year are anticipated. If less than three hundred (300) cars per year are anticipated Class II rail can be used.

Class 1		
Rail Weight	**Max. Vert. Wear**	**Max. Hor. Wear**
141	5/16"	1/8"
133-136	1/4"	1/8"
131-132	3/16"	1/8"
119	5/32"	1/16"
112-115	1/8"	1/16"
Corrugation up to .010 allowed		
Class 2		
Rail Weight	**Max. Vert. Wear**	**Max. Hor. Wear**
141	7/16"	1/4"
133-136	3/8"	1/4"
131-132	1/4"	1/4"
119	1/4"	1/8"
112-115	3/16"	1/8"
Two dime sized engine burns per 39' corrugation up to .020 and 1/4" field size lip allowed		

10.2 Fastenings:

a. Angle or Joint Bars, new or certified, to match rail section used. Industry/ Applicant to provide compromise joint bars or compromise welds to match RFTA's rail section at 13- foot clearance point or location designated by RFTA.

b. Tie Plates, new or secondhand, and double shouldered plates no smaller than 2 times the base of the rail. Track to be fully plated. The use of single shoulder tie plates is prohibited.

c. Track Bolts, new or secondhand, appropriately sized for the bolt holes in the rail section with a length sufficient for a full nut and heavy-duty spring washers (new). The bolts, washers, and nuts must be for the proper bar and rail. (FRA 49CFR213.121)

d. Track Spikes, new 5/8" x 6" or 5/8" x 6 1/4" installed per UP or AREMA Standard. No Industrial or reclaimed worn spikes, please.

e. Rail Anchors, new or reformed, box-anchored every other tie. All switch ties will be completely box anchored. For crossties that use elastic fasteners, rail anchors are not required.

f. Compromise Joint Bars or Compromise Field Welds shall be utilized when rails of dissimilar rail sections are connected. Turnouts will use the same rail section on the running rail, closure rails, and turnout components through the body of the turnout. It is the Applicant/Industry's responsibility to furnish, install and maintain compromise joint bars with the proper fishing, etc. connecting to RFTA owned track. All rail joints and welds should be kept out of grade crossings, where possible.

g. Insulated Joints/I Bonds to be furnished by Industry and shall be all new material. Insulated joints/I bonds will be installed by industry at locations designated by RFTA's authorized representative.

h. Field Welding will be done in accordance with current UPRR or AREMA procedures (See **Section 16.00**).

10.3 Timber Ties:

Light Traffic	<1000 cars per year	7” x 9” x 8’6” Ties @ 20 Ties per 39 ft. rail (24” on center)
Medium Traffic	>1000 & <2000 cars per year	7” x 9” x 9’0” Ties @ 22 Ties per 39 ft. rail (21.25” on center)
Heavy Traffic	>2000 cars per year	7” x 9” x 9’0”’ Ties @ 24 Ties per 39 ft. rail (19.5” on center)

a. New creosoted Oak or Douglas fir ties only for new construction.
b. Only new creosoted Oak or Douglas fir switch ties will be used to accommodate turnout pattern.

10.4 Concrete Ties:

Light Traffic	<1500 cars per year	8’ 3”, 600 lb. tie at 26” centers 8’ 6”, 525 lb. Tie at 24” centers 8’ 6”, 720 lb. tie at 28” centers
Medium/Heavy Traffic	>1500 cars per year	8’ 3”, 600 lb. tie at 24” centers 8’ 6”, 720 lb. tie at 26” centers

a. Continuous Welded Rail is recommended for use with Concrete Ties.
b. Concrete switch ties may be used where concrete standard ties are used.
c. Concrete ties must be new ties produced in accordance with AREMA Guidelines.
d. See UP **Standard Drawing No. 0204** as an example of a 720 lb. Tie.

10.5 Steel Ties (No Steel Ties in Signal Territory)

Levels of Traffic	10 mm Thickness	8’ 6” ties @ 20 ties per 39 ft. rail @ 24” centers

10.6 Composite Ties (Contact RFTA for Current List Of Acceptable Types & Vendors):

Light Traffic	<1000 cars per year	6” x 8” x 8’ Ties @ 20 ties per 39 ft. rail @ 24” centers
Medium Traffic	>1000 & <2000 cars per year	7” x 9” x 8’ 6” Ties @ 22 ties per 39 ft. rail @ 21.25” centers
Heavy Traffic	>2000 cars per year	7” x 9” x 8’6”” Ties @ 24 ties per 39’ rail @ 19.5” centers

10.7 Turnout Components - All turnout components shall be new or certified reconditioned material. All turnout components in RFTA owned or maintained track shall be new material supplied by a RFTA/UP approved vendor. The Industry/ Applicant and/ or its Contractor need to provide verification that the turnout(s) are from a UP/RFTA approved vendor depending on application & location of turnout to be installed.

10.8 Turnout Assembly - The Industry and/ or its Contractor need to verify with RFTA staff or designated consultant that the turnout(s) to be installed on the RFTA owned portion of the track will be provided loose or assembled (complete panel or sectional panel). If the assembly of the Turnouts is by the Industry/ Applicants’ Contractor, the assembly in all cases must occur off of RFTA right of way.

11.0 BALLAST REQUIREMENTS

Under light traffic, crushed rock ballast or equivalent material, per AREMA Standard 5 gradation must be utilized. Under heavy traffic, crushed rock ballast, mainline quality, AREMA Standard 4A gradation must be utilized. The allowable wear based on the Los Angeles Abrasion Test, not greater than 35%, per ASTM C-535. Minimum depth is 15" between the top of subballast and top of timber, composite or concrete ties. The minimum depth for steel ties is 8” from top of subballast to top of the tie. The full ballast section extends 9" beyond ends of the tie for jointed rail and 12" for welded rail and thence to subgrade on not less than 3:1 slope. Ballast shall be quarried rock, crushed to proper gradation, with fully fractured faces. Industry’s Contractor shall provide certification that the ballast meets RFTA or CDOT interim Silver Bible specifications.

12.0 TRACK CONSTRUCTION SPECIFICATIONS

12.1 Experienced personnel skilled in railroad track construction shall supervise track laying and surfacing.

12.2 Ties shall be uniformly spaced center to center of tie. Ties shall be laid at right angles to the rail and at least one will be located at the joint location as required in the FRA track standards for the class of track it is intended for.

12.3 When handling or spacing ties care shall be taken not to damage them with picks or hammers. Tie tongs shall be used for this purpose.

12.4 The pulling of spikes, once driven, shall be avoided insofar as possible. When spikes are pulled, the holes shall be immediately plugged with creosoted tie plugs of the proper size to completely fill the hole, or an approved form of plugging compound must be used.

12.5 The bottom of the rail, the tie plate and the wearing surface of the tie shall be cleaned before the rail is laid.

12.6 Tie plates shall be applied at the time the rail is laid to avoid unnecessary spiking. Plate shoulder shall bear against the outside base of the rail.

12.7 Rails shall be unloaded, stored or distributed along the roadbed in such a manner as to prevent damage.

12.8 For jointed track, rails should be laid with a 12-foot staggered joint arrangement.

12.9 If a determination is made to stagger rail, then rails of miscellaneous lengths less than 39 feet shall be used at suitable intervals for maintaining the proper stagger of joints on curves.

12.10 Rails less than 15 feet long shall not be used except for temporary closures.

12.11 Expansion shims of hardwood or fiber shall be used to control expansion. The following table prescribes the correct thickness for the expansion shim for various ambient temperatures:

RAIL TEMPERATURE	33 FT. RAIL OPENING	39 FT. RAIL OPENING	78 FT. RAIL OPENING
Below 25° F.	1/4"	1/4"	1/2"
25° to 50° F.	1/8"	3/8" every other joint	3/8"
51° to 75° F.	1/8" every other joint	1/8"	1/4"
76° to 100° F.	1/8" every third joint	1/8" every other joint	1/8"
Above 100° F.			1/8" every other joint

12.12 Rails shall be laid to ensure good alignment, and the rail ends must be brought squarely together against expansion shims and shall be bolted before spiking.

12.13 Rails shall be cut square and clean by means of rail saws. Holes for complete bolting of cut rails shall be drilled according to AREMA Specifications. Under no circumstances shall new holes be drilled between two holes already drilled. Cutting rails or drilling holes in cut rails by means of acetylene or electric torch will not be permitted.

12.14 The appropriate number of bolts shall be applied according to the rail joint used. The nuts of all bolts shall alternate uniformly inside and outside of each joint. Each bolt shall be equipped with a spring washer of the size required to fit the diameter of the bolts used.

12.15 The right-hand rail going away from the switch points or the outside rail on curves shall first be spiked in position in its proper relation to the lined end of ties. The opposite rail shall then be spiked to true gage (4'-8 1/2”). Curved track shall be gauged as follows:

a. Lay track to standard gauge on tangents and curves of less than 6 degrees.
b. Lay track to a gauge of 56-3/4” on curves of 6 degrees or greater.

12.16 On tangent track and on curves up to 4 degrees, two spikes (one inside and one outside the base of rail) shall be used to fasten each rail to each tie. On curves at least 4 degrees and less than 8 degrees, two spikes inside and two spikes outside shall be used on each rail. On curves of 8 degrees or more, use three spikes inside and two spikes outside shall be used on each rail.

12.17 Spikes shall be staggered so that the outside spikes shall be on the same side of the tie and the inside spikes on the opposite side.

12.18 Rail shall not be struck with a maul or heavy tool when spiking, gauging or lining.

12.19 Spikes shall be started vertically and square and be driven straight with full bearing against the base of the rail. Straightening with maul or spikes started crooked will not be permitted. Spikes started crooked shall be pulled, the holes plugged and spikes re-driven. Immediately after completion of track surfacing, spikes shall be settled in place with the underside of the head of the spike contacting the top of the base with a minimum of pressure.

12.20 Rail anchors control longitudinal rail movement on ties from temperature variations, traffic, grade, and train braking. Anchors are not required on ties with elastic fastening systems unless additional restraint is necessary to control undesired rail movement. Anchors should be new or reformed. On all tracks, apply rail anchors out-of-face along each rail, directly across from each other on the same tie. Use Standard Box Pattern (every other tie) or Solid Box Pattern.

12.21 When the track has been raised to within 4 inches of the final grade and properly compacted, the final lift shall be made by jacking the track up to the exact elevation provided by the grade stakes. The ballast shall then be tamped under the ties. The space extending from 15 inches inside either rail to the ends of the ties shall be thoroughly tamped. The tie centers shall be left untamped. Unless otherwise authorized, this final lift shall be tamped with tamping bars, tamping picks or by approved tamping machines. In making the finishing lift, the spot board and level board shall be used with care and the track brought to a true surface and required elevation.

12.22 After the track has been brought to true surface, elevation, and grade, it shall be given a final lining and placed in true alignment.

12.23 Turnouts shall be constructed of all new or certified reconditioned rail and other track material. Unless otherwise approved by RFTA, all turnouts must be fabricated to UP or AREMA standards. **Turnouts in RFTA owned or maintained track will be constructed with all new rail and other track material supplied by a UP/RFTA approved vendor.**

12.24 Road crossings on industry-owned trackage may be constructed with plank and asphalt or entirely with asphalt. Maintain the flangeway opening along the gage side of the running rail <u>at no less</u> than 3 inches. Curved Concrete Panels, must be utilized as conditions warrant in concrete panel installations on curves over 0°15’00”.

12.25 Timber crossing materials shall conform to AREMA/ Railway Tie Association (RTA) and shall be square-edged and of sound creosoted planks of fir or hemlock, or equal, with the height of plank equal the distance from the top of tie to top of the rail. The planks are to be fastened with countersunk 3/4" x 12" galvanized Lewis Nut & Bolt (La Junta) washer head drive spikes, in predrilled holes.

12.26 Each crossing location will be evaluated individually by the RFTA (and Road Authority if applicable) to determine minimum crossing surface material requirements. Crossings may require the useof precast concrete materials. Determination of and type of warning devices on public roadways will be made by a joint recommendation of RFTA, Road Authority, and/or Government Regulatory Body (Colorado PUC).

12.27 Earthen bumpers or Hayes WD/WH or WK shall be used whenever possible. If Industry/ applicant chooses to use other than an earthen bumper or Hayes WD/WH/WK, they must submit to the RFTA the proposed device for review and approval. If bumping posts are used, they shall be Hayes Type WD with Shock Free Head, or equal. (Wheel Stops or tie bumpers forbidden)

13.0 DERAILS

13.1 Derails must be clearly visible. A derail is required for all new construction or modifications of any existing trackage, and it shall be appropriately sized for the designated rail section, complete with proper length connecting rod and operating stand with the target. The type of derail required, its placement, and type of switch stand to be used shall be determined by RFTA or its authorized representative and will be dependent on track gradient, independent movement of cars by the customer, and anticipated track use.

13.2 Derails in a signaled territory are to be placed at a point sufficiently ahead of insulated joints so equipment is derailed before fouling track circuit. (Minimum two car lengths) Derails may require signal insulation material as required by RFTA. If insulation material is required, it will be installed by industry/ applicant at locations designated by the RFTA. Walkways conforming to RFTA standard must be installed around all derail switch stands.

13.3 Consideration should be given for placement of derail to avoid conflicts with adjacent tracks, railroad signal installations, communication lines, power lines, pipelines (overhead or underground), roadways, ditches, waterways, storage tanks, buildings, or other structures.

13.4 Power Operated Derails may be required if Power Operated Turnouts (POTO) are used. NOTE: Special ties on Derail components are required if it is Power Operated.

14.0 WALKWAY REQUIREMENTS

14.1 **Safety** - Walkways shall be constructed and maintained to provide a reasonable regular surface and shall be maintained in a safe condition clear of vegetation, debris, standing water, and other obstruction, which constitute a hazard.

14.2 **Grades and Slopes** - Walkways shall not have a grade and slope in excess of approximately 1 inch of elevation per every 8 inches of horizontal length in any direction. An excess slope is permissible where the proximity of adjacent tracks so long as the slope between tracks is constant.

14.3 **Construction** - For walkway standards refer to the California PUC General Order #118 referenced at the end of this section. Walkways shall be constructed to a minimum width of 8’ 6”, as measured from the centerline of the track. Walkways shall be constructed and maintained in such a manner that the elevation of its surface is at least level with the top of ties, but not higher than the top of the rail. Walkways are to be constructed per AREMA Standard 57 ballast unless prior approval by RFTA is granted for alternate size material. Reconstruction shall mean the use of more than 50%

of material such as ties, ballast or fill or more than 50% of the current capital cost of the improvement.

Where crushed material is used for walkway surfaces adjacent to tracks in railway switching yards, 100% of the material must be capable of passing through a 1 ½ inch square sieve opening and 90-100% of the material must be capable of passing through a 1-inch square sieve opening; provided, however, that a de minimis variation of this standard shall not be a violation where RFTA has made a good-faith effort to comply. This standard does not apply in emergencies.

14.4 Requirements - Walkways shall be located along both sides of the track for a minimum distance of 125 feet on each side of every switch stand or another trackside switch-throwing mechanism. Walkways are required around all derail switch stands. (see **UP Exhibit 'E' Drawing**).

14.5 Minimum Distances - Walkways shall be continuous and maintained from the switch stand through the switch frog and along the diverging track. An additional 3 feet of walkway width shall extend for a minimum distance of 4 feet in each direction from the switch stand or another trackside switch- throwing mechanism on the side of the track where the said mechanism is located. This additional 3 feet of width shall be gradually tapered back to the 8' 6" minimum width, as measured from the centerline of the track, a distance of not less than 20 feet.

14.6 Guideline - These specifications are provided only as a guideline for design and should not be taken as authority to construct walkways. All walkway construction must conform to the RFTA specifications or the federal, state or local specifications whichever is the most protective from the standpoint of public safety. All walkway construction shall comply with current and applicable federal, state and local laws. Industry/ Applicant shall be responsible for the proper construction of all walkways. In some areas, the Industry will be required to stockpile sufficient walkway ballast at a location designated by RFTAs authorized representative, for installation by RFTA or contract forces.

For additional information and guidance, please refer to the General Order No. 118-A of the Public Utilities Commission of the State of California at
http://docs.cpuc.ca.gov/word_pdf/general_order/go118.pdf.
The Order, Regulations Governing the Construction, Reconstruction, and Maintenance of Walkways Adjacent to Railroad Trackage and the Control of Vegetation Adjacent Thereto, is an excellent guide.

15.0 BRIDGE FOOT WALK AND HANDRAIL

Any bridge located within **500 feet** of a proposed or existing point of switch shall have a foot walk and handrail on both sides of the structure.

If the Structure is owned or maintained by the Union Pacific Railroad (UP) or RFTA, the design and installation of the walkway and handrail system shall be completed by the RFTA at Applicant/Industry's Expense.

If the structure is owned or maintained by the Industry, the Industry will design and install the walkway and handrail system. The design of the walkway and handrail system must be approved by RFTA prior to construction. Detailed Construction Plans for walkway and handrail system must be stamped and sealed by a Registered Professional Engineer. Prior to designing the walkway and handrail system, contact RFTA for additional guidance.

16.0 FIELD WELDING

AREMA or UP approved welds must be installed. The welds currently approved are Railtech Boutet one shot kits and Orgo-Thermit single-use kits. The Industry/ Applicant and the individual installing the welds must be qualified by the manufacturer of the kits being used and have documentation to support such qualification. All welds must conform **at a minimum, to meet the latest edition of the American Railway Engineering and Maintenance of Way Association (AREMA) Manual. The link to the AREMA site is** www.arema.org**.**

It is RFTA and UP's policy that Field Welds made on RFTA owned or maintained track be inspected by RFTA's rail representative or designated consultant.
Additional information at http://www.uprr.com/aboutup/operations/specs/track/index.shtml

SECTION 17.0 APPENDIX (.pdf drawings attached)

- TRACK MATERIAL –OTHER TRACK MATERIAL
  - Switch Stands
    - 2020 Switch Targets
    - 2050 Switch Padlock
    - 2101 Switch Stand Placement
    - 2103 No. 112E High Switch Stand
    - 2116 No. 22-E Switch Stand, Trailable
    - 2120 No. 1003ARS Automatic Switch Stands, Trailable
  - Rail & Tie
    - 0204 Prestressed Scalloped Concrete Tie 497S
    - 0210 Wood and Composite Cross Ties
    - 0215 Rubber Padded Concrete Ties
    - 0440 Double Shoulder Tie Plate For 115 Lb. RE Rail
    - 0441 Double Shoulder Tie Plate For 132 Lb. And 136 Lb. Rail
    - 0904 Joint Bars, Miscellaneous
    - 0948 Compromise Joint Bars
    - 130005 6" Track Spike
    - 130800 Rectangular head timber coach screw
  - Derails
    - 2000 Permanent Derail Installation Instructions
    - 2005 16'-6" Double Switch Point Derail
    - 2006 Single Switch Point Derail
    - 2007 Sliding Derail With Wheel Crowder
  - CROSSING PANEL DATA
    - 0303 Light Duty Road Crossing Asphalt with Rubber Seal Sections
    - 0302 Installation Of Road Crossing With Prefab Timber Panels
    - 0304 Installation Of Road Crossing With Precast Concrete Panels
    - 0308 General Specifications for Road Crossing with Concrete Panels
    - 200102 Precast Concrete Panels for 10' Long Wood Ties
    - 200200 Layout for Concrete Panels for 9' Long Wood Ties
- COMMON STANDARD TURNOUTS
  - Turnouts General

- Exhibit F Standard Turnout Data for Industrial Tracks
- 0050 Design Data for Turnout Layout
- 0080 Standard Turnout Applications

o NO 9 Turnout
- 341000 No. 9 Turnout 136 Lb. Panel No. 1
- 341001 No. 9 Turnout 136 Lb. Panel No. 2
- 341002 No. 9 Turnout 136 Lb. Panel No. 3 with RBM Frog
- 341003 No. 9 Turnout 136 Lb. Panel No. 4
- 341004 No. 9 Turnout 136 Lb. Panel No. 3 With SMSG Frog
- 341100 No. 9 Turnout 16'-6" Straight Switch, Turnout Geometry
- 341200 No. 9 Turnout, Bill of Materials

o NO 11 Turnout
- 343000 No. 11 Turnout 136/141 Lb. Panel No. 1
- 343001 No. 11 Turnout 136/141 Lb. Panel No. 2
- 343002 No. 11 Turnout 136/141 Lb. Panel No. 3 With RBM Frog
- 343003 No. 11 Turnout 136/141 Lb. Panel No. 4
- 343004 No. 11 Turnout 136/141 Lb. Panel No. 3 With SMSG Frog
- 343100 No. 11 Turnout 19'-6" Curved Switch, Turnout Geometry
- 343200 No. 11 Turnout with RBM, SMSG, and Spring Frogs, Bill of Materials

Additional information at http://www.uprr.com/aboutup/operations/specs/track/index.shtml

SECTION 17 – EXHIBITS FOLLOWING:

9.0 Clearances

In accordance with AREMA Manual (Chapter 28), Colorado Code of Regulations (4CCR723-7), FRA Clearance Regulation(49CFR214.7) and FHWA / AASHTO Design Standard (A Policy on Geometric Design of Highways and Streets, AASHTO) the following is the minimum design standard as stated through the **Colorado Public Utilities Commission published version of 4CCR723-7.**

COMMENTS SHOWN BOLD ARE RFTA'S PREFERENCES FOR CORRIDOR SUSTAINABILITY AND CLARIFICATION OF CONFLICTING RULES BETWEEN AGENCIES.

SOURCE: 4CCR723-7

Railroad Clearances 7320. Applicability

Rules 7321 through 7328 apply to all railroads and railroad corporations which operate on standard gauge railroad track.

7321. Definitions.

The following definitions apply only in the context of rules 7321 through 7328.

(a) "Overhead clearance" means the vertical distance from the top of the highest rail to a structure or obstruction above.

(b) "Side clearance" means the shortest horizontal distance from the centerline of the track to a structure or obstruction at the side of the track.

(c) "Track clearance" means the shortest horizontal distance between the center lines of adjacent tracks.

7322. Diagrams.

The following two diagrams are referenced in rules 7321 through 7328 as "Diagram I" and "Diagram "II":

(a) Diagram I is described as follows: starting at the centerline of track at top of rail and extending 5'6" both sides horizontally and level therewith, thence upward diagonally to a point 4'0" above top of rail and 8'0" laterally from centerline of track, thence vertically to a point 16'0" above top of rail, thence diagonally upward to a point 22'0" above top of rail and 4'0" horizontally from center of track, thence horizontally to center of track.

(b) Diagram II is described as follows: starting at the center of track at top of rail and extending 6'0" both sides horizontally and level therewith, thence diagonally upward to a point 4'0" above top of rail and 8'6" laterally from centerline of track, thence vertically upward to a point 15'9" above top of rail, thence diagonally upward to a point 22'6" above top of rail and 4'0" horizontally from center of track, thence horizontally to center of track.

7323. Special Provisions.

(a) All existing structures, operating appurtenances, pole lines, service facilities, and track arrangements shall be exempt from these rules, except as hereinafter provided.

(b) No change in existing track location or elevation shall be made which will reduce existing vertical or horizontal structural clearance below the minimum specified in rules 7320 through 7328.

(c) No repair or maintenance work shall be done on structures, facilities or appurtenances adjacent to tracks which will reduce existing vertical or horizontal structural clearance below the minimum specified in rules 7320 through 7328.

(d) As used in paragraphs (b) and (c), minimum clearance shall be as in Diagram I.

(e) Where an existing structure does not provide clearance equal to the minimum of the paragraph or such other minimum less than that which may be herein specified, the portion of the structure producing the impaired clearance may be repaired and maintained by partial replacements, which shall in no case reduce the clearance available at the time this order takes effect.

(f) When the owner shall replace in its entirety the portion of a structure which has not previously provided standard clearance, the rebuilt portion must when complete, provide the full standard clearance of this order unless otherwise ordered by the Commission.

(g) Existing tracks.

(I) Existing tracks of all kinds may be maintained by reballasting, resurfacing, and replacing rails and ties subject to the limitations of paragraph (b). Where existing yards are completely replaced or are partially replaced as a unit or section of a master plan, the arrangement must meet the provisions of this order both as to track centers and clearances to structures and other facilities being built in connection with and as a part of such plan. Existing structures which are to remain and which do not provide the minimum clearance of paragraph (d) with respect to the proposed new tracks must be approved by the Commission for an exemption from the terms of this order.

(II) Existing tracks having less vertical clearance than that specified in paragraph (d) may be maintained but the top of rail may not be raised without a corresponding rise of the overhead structure so as to maintain the existing available clearance.

(III) Existing tracks having less horizontal clearance between them than is herein specified for new construction or having less horizontal clearance to structures than is specified in paragraph (d) may be maintained but they may not be shifted horizontally to reduce either the existing track centers or the existing structural clearance.

7324. Overhead Clearances.

(a) Generally.

(I) Overhead clearance generally shall be at least 22'6". **(RFTA prefers 23'-0" or more to allow future track maintenance, change in rail size, etc. in order to avoid future undercutting expense)**

(II) Overhead clearances may be reduced to comply with paragraphs (d) and (e).

(b) Inside enclosed buildings.

(I) Overhead clearance inside of enclosed buildings may be reduced to 18'0", provided that this clearance shall apply only to tracks terminating within the building or in the immediate plant area if said tracks should extend through the building.

(II) Overhead clearance of doors may be reduced to 17'0".

(c) Tunnels.

(I) The minimum overhead clearance in tunnels shall be 23'0".

(II) The clearance may be decreased to the extent defined by the half-circumference of a circle having a radius of 8'0" and tangent to a horizontal line 23'0" above the top of rail at a point directly over the center line of the track.

(d) Through Bridges.

(I) The minimum overhead clearance in through bridges shall be 22'0". **RFTA prefers 24'-6" in case of future doublestack container moves and electric catenary requirements.**

(II) See paragraph 7323(d) and Diagram I

(e) All other structures.

(I) The minimum overhead clearance for all other structures shall be 22'6". **23'-0" preferred**

(II) Except as herein specifically provided, all other structures shall have at least the clearances illustrated by Diagram II.

(III) Overhead clearance for structures other than buildings may be reduced if approved by the Commission.

(f) All wires, in general, shall have a minimum vertical clearance of not less than that specified by the National Electrical Safety Code, as incorporated by reference in rule 7008.

(g) Engine houses and shop buildings are exempt from paragraphs (a) through (e) of this rule.

7325. Side Clearances.

(a) Generally.

(I) Side clearance generally shall be at least 8'6". **10'-0" preferred**

(II) Wherever practicable, all posts, pipes, warning signs, and other small obstructions should be given a side clearance of at least 10'0".

(III) Side clearance may be reduced to comply with provisions of subparagraph (c)(I).

(b) Platforms.

(I) The side clearances in this paragraph to apply to both mainline and sidetracks unless otherwise indicated.

(II) The minimum side clearance for platforms that are 8" or less above the top of rail shall be 5'0".

(III) For platforms that are greater than 8" above the top of the rail and 4'0" or less above the top of rail:

(A) The minimum side clearance for freight platforms on side tracks shall be 6'3" or 8'0".

(B) If side clearance is reduced to 6'3" on one side, a full clearance of 8'0" shall be maintained on the opposite side.

(C) No intermediated clearance is permitted, except compensation for curvature under paragraph (i).

(D) The minimum side clearance for freight platforms on mainline tracks or passing tracks shall be 8'6".

(IV) For platforms that are greater than 4'0" above the top of rail:

(A) The minimum side clearance on side tracks shall be 8'0".

(B) The minimum side clearance on mainline and passing tracks shall be 8'6".

(V) Combination platforms. Platforms covered under subparagraph (b)(II) may be combined with platforms covered under either subparagraph (b)(III) or (b)(IV) provided that the lower platform presents a level surface to the face of the wall of the platform with which it is combined. No other combinations are permitted.

(VI) The minimum side clearance for all other platforms shall be 8'0".

(A) This subparagraph (VI) applies to side tracks only.

(B) Retractable platforms, either sliding or hinged, which are attached to a permanent structure, must be so constructed that, when retracted or in a non-working position and firmly secured or anchored, the resulting clearance shall not be less than clearances mandated by rules 7321 through 7328.

(c) The minimum side clearance for bridges and tunnels shall be 8'0".

(I) Lower section of bridges and structures of bridges.

(A) This subparagraph applies to those sections of bridges and structures of bridges that are at or below 4'0" above the top of the rail.

(B) Handrails, water barrels and refuge platforms on bridges and trestles, water columns, oil columns, block signals, or cattle guards, or portions thereof, which are 4'0" or less above top of rail, may have clearances decreased to the extent defined by a line extending diagonally upward from a point level with the top of rail and 5'6" distant laterally from centerline of track to a point 4'0" above top of rail and 8'0" distant laterally from centerline of track.

(C) The clearances authorized in this subparagraph (I) are not permitted on through bridges where the work of train-men or yardmen require them to be upon the decks of such bridges for the purpose of coupling or uncoupling cars in the performance of switching service on a switching lead.

(II) Upper section of bridges and tunnels.

(A) This subparagraph applies to those sections of bridges, structures of bridges, and tunnels that are greater than 16'0" (Diagram I) or 15'9" (Diagram II) above the top of the rail.

(B) Side clearances in tunnels and through bridges may be decreased to the extent permitted by paragraphs 7324(c) and (d).

(d) The minimum side clearance for all of the following shall be 3'0":

(I) switch boxes that project 4" or less above the top of rail;

(II) switch operating mechanisms that are necessary for the control and operation of signals and that project 4" or less above the top of rail; and

(III) interlocks that project 4" or less above the top of the rail.

(e) The minimum side clearance for mail cranes and train order stands shall be 8'6", but only when such cranes or stands are not in an operative position.

(f) The minimum side clearance for oil and water columns shall be 8'0", except as provided

by subparagraph 7325(c)(I)(B).

(g) Signals or switch stands.

(I) The minimum side clearance for signals and switch stands shall be 6'0" if such signals or switch stands are 3'0" high or less above the top of rail when located either between tracks or where it is not practicable to provide clearances as otherwise prescribed in rules 7321 through 7328.

(II) The minimum side clearance for signals or switch stands that are over 3'0" high shall be 8'3".

(III) Signals and signal poles higher than 3'0" above the top of rail shall, for the portions thereof that are higher than 4'0" above the top of the rail and less than 16'0" above the top of the rail, keep such portions 8'6" from the center of the track. The portions thereof that are below 4'0" and over 16'0" shall not encroach on the limits illustrated by Diagram II.

(h) Buildings and entrances.

(I) The minimum side clearance inside buildings shall be 8'0".

(II) At elevations of 4'0" or less above the top of rail inside of buildings, the minimum side clearance may be reduced on one side of the track to 6'3", provided that 8'0" is maintained on the opposite side.

(III) The minimum side clearance at building doors shall be 7'0".

(IV) Side clearance at doors may be reduced to 5'9" on one side of the track only, provided a full clearance of 8'3" is maintained on the opposite side.

(i) Curved track. The horizontal clearances specified in rules 7320 through 7328 relate to tracks on a tangent. On the curved track, the clearances shall be increased to allow for the overhang and the tilting of a car 85 feet long, 60 feet between centers of trucks, and 14 feet high.

(j) The minimum side clearance for material, merchandise, or other articles adjacent to tracks shall be 8'6".

(k) Engine houses, shop buildings, and passenger platforms, at car floor height, are exempt from this rule.

7326. Track Clearances.

(a) Generally. The minimum distance between the center lines of parallel standard gauge railroad tracks, which are used or proposed to be used for transporting freight cars, shall be 14'0", except as hereinafter prescribed.

(b) Main and subsidiary tracks.

(I) The minimum distance between two parallel main tracks shall be 14'0". **(15'-0" UPRR)**

(II) The minimum distance between the main and passing tracks shall be 15'0". **(25'-0" FRA)**

(III) When another track is constructed adjacent to a passing track the clearance may be as prescribed in paragraph (a).

(c) The minimum clearance between the center lines of a parallel team, house, or industry tracks shall be 13'0". **Existing trackage only, 15'0" for all new construction**

(d) Ladder tracks.

(I) The minimum clearance between a ladder track and any parallel track, except another ladder track, shall be 17'0". **(25' FRA & UPRR Standard, protects man from working between cars)**

(II) The minimum clearance between a ladder track and another parallel ladder track shall be 20'0".

(e) Existing tracks. Existing tracks built prior to June 1, 1952, may be extended at the railroad company clearances prevailing at the time the tracks were built.

7327. Public Roads, Highways, and Street Crossings.

(a) Where a public road, highway, or street crosses above any railroad or street railroad track used or proposed to be used for transporting freight cars, minimum overhead and side clearances as set forth in this rule must be observed.

(b) Overhead clearances.

(I) Where a railroad or street railroad crosses above any public road, highway or street, a minimum overhead clearance of 14'0" shall be provided above the surface of such road, highway, or street. **15'-0", anything less will involve lighted advance signage and sacrificial beams.**

(II) Where a railroad or a street railroad crosses any highway of the State Highway System or any Federal-Aid Highway, a minimum overhead clearance of 16'0" shall be provided above the surface of such highway or street. **16'-6", anything less will involve lighted advance signage and sacrificial beams.**

(c) Minimum opening clearances.

(I) Where a railroad or street railroad crosses above any public road, highway, or street on a single supporting span, a minimum width of 26'0" shall be provided for the opening for such public road, highway, or street. **30'-0" and secure pedestrian walkways preferred.**

(II) Where a railroad or street railroad crosses any highway of the State Highway System, or any Federal-Aid Highway, on a single supporting span, a minimum width of 30'0" shall be provided for the opening of such highway or street.

(III) Where two or more supporting spans are used for such an opening, the minimum widths specified in subparagraphs (I) and (II) of this paragraph shall be provided for each of such supporting spans. **Supports will be suitably robust and protected by energy absorbing collision protection.**

7328. General Conditions.

(a) No restricted clearance set out in rules 7320 through 7328 shall apply to falsework, shoo-fly tracks, or other temporary emergency conditions caused by derailments, washouts, slides, or other unavoidable disasters.

(b) No restricted clearances set out in rules 7320 through 7328 shall apply to the ballast, track material, or construction material unloaded on and adjacent to tracks for contemplated use thereon or in the immediate vicinity, nor shall they apply to falsework or temporary construction necessary on any construction project

10.0 Fencing

RFTA has adopted the proposed new AREMA 2015 Fence Standard (AREMA Manual For Railway Engineering 1.6.1 thru 1.6.9, which is stated below. Please See Appendix B PLUS Sections 1.6.7 and 1.6.8 in the current manual covering snow fences and sand fences. Cited sections of the Manual are noted with their respective section (subpart and adoptive year.

From Arema Chapter 1, Sub Part 6; Fences (2014) and proposed 2015, as noted:

6.0 Fencing (2014)

GENERAL

The purpose of this section is to provide information on fencing options that are related to the design, construction, and maintenance of the railroad roadbed and track structure.

When fencing is deemed appropriate, it may be utilized to delineate property boundaries, control ingress to and egress from the railway property by humans and animals, and assist in controlling environmental conditions such as wind-driven snow and sand.

Fences or other positive barriers may be warranted when railroad operations abut areas which are accessible to the general public. However, specific recommendations regarding the placement of fencing for the protection of employees and the general public from railway operations, as well recommended practice for utilizing fencing to secure railroad property in stations, yards, and terminals are not covered by this section.

For reasons of public safety and the security of railroad operations, longitudinal (parallel) pedestrian /recreational use of RFTA's operating right-of-way should be strongly discouraged. Should site-specific areas of longitudinal (parallel) pedestrian / recreational use be deemed acceptable by the operating railroad, installation of appropriate fencing or a positive non-climbable barrier is recommended. The location and design of such fencing or positive barriers should include full consideration of the present and future railroad operating needs, and the protection of the public and railroad. Design parameters for such installations will be site specific.

6.1 Fence Types and Usage General Considerations:

For all fence installations, the specific location of the fence on, or within RFTA's right of way must be well thought out. Criteria that should be considered include but are not limited to;

- Real Estate implications of fence installation.

- Operating Railroad's design standards.
- State or Operating Railroad's Clearance Requirements (use most restrictive).
- Line of sight considerations for Railroad operations.
- Line of sight considerations for public and private crossings of the Corridor.
- Environmentally sensitive areas such as wetlands.
- Adverse topography.
- Existing subsurface and aerial utility installations.
- Local ordinances dictating material types.

6.1.1 Right-of-Way

This broad-based category includes fences installed to delineate properties, fences installed to delineate operating corridors within larger railroad property holdings, fences installed to control access to RFTA's corridor by domestic and wild animals, and fences installed to passively discourage trespass by humans. Typical heights are 48".

Fence materials vary by region, however, rolled steel, steel tube, or treated wooden posts are most common. Often a combination of post materials are utilized with treated wood being utilized for high-pressure locations such as ends, brace points, and corners, and rolled steel "T" section posts used for intermediate line points. Fence fabric may be uniformly spaced welded wire patterns, or welded wire patterns that are graduated with openings that increase in size by with height (commonly known as hog fence). Multiple strands of barbed wire are also used in lieu of woven wire in some regions.

Certain situations may warrant the use of decorative fencing to demark the right-of-way or to safely channel pedestrian traffic. Considerations for the use of decorative fencing are discussed in more detail in Section 6.4.

Gates in right-of-way fences should be so configured to open away from the track where ever possible or be configured with positive stops to prevent the ability of a gate in the non-closed position to foul the railroad clearance envelope. If a gate is installed at an at-grade private vehicle crossing, consideration of the gate's position relative to the track, and reasonably anticipated operational practice of the user should be considered to avoid placing a vehicle in the foul of the railroad clearance envelope while a vehicle operator attempts to open or close the gate.

Although most typically, right-of-way fences are placed on the operating property or 'right-of-way' line, the right-of-way fence may or may not demark a legal property boundary. Location may ultimately depend upon the nature of RFTA's property holding, specific legal agreement(s) with adjacent property owners, or other installation mandates. If right-of-way fence is not to be installed on the operating 'right-of-way' line, the Real Estate law implication of the fence placement should be reviewed on a case by case basis before installation.

Some jurisdictions and operating railroads may have in place specific requirements that offset the right-of- way fence a predetermined distance inward of the legal 'right-of-way' line. In addition, some jurisdictions may dictate the type of fence fabric that can be utilized in an effort to limit the mobility of certain types of wildlife.

The following photographs provide typical examples of Right-of-way fencing;

Exhibit 1 – Woven Wire Right-of-way Fence

Exhibit 2 – Offset Right-of-way Fence Swing Gate (viewed from track zone)

Exhibit 3 – Multi-strand Barb Wire Right-of-way (Range) Fence

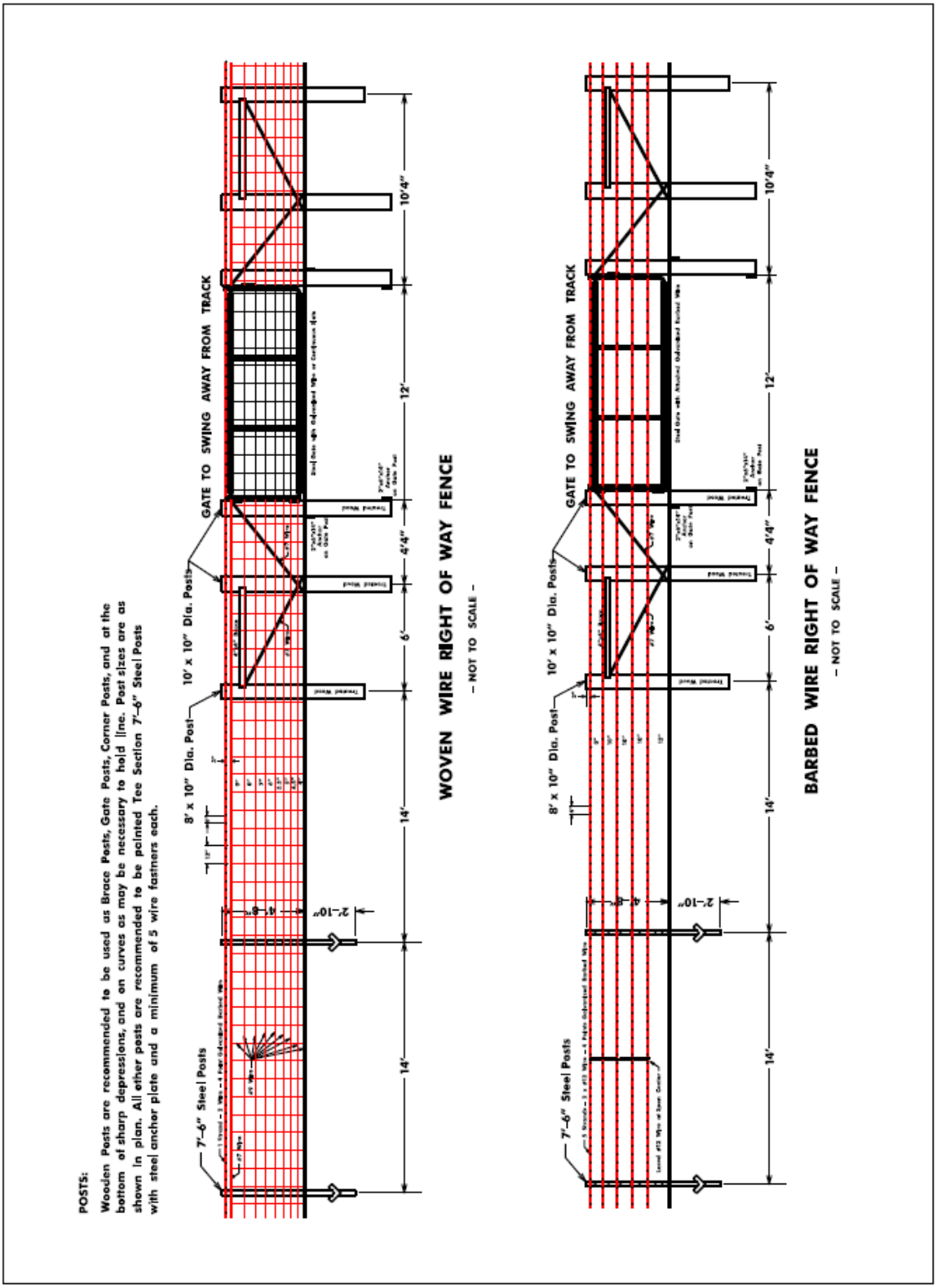


Exhibit 4 - Representative design plan for a Woven Wire and Multi-strand Barbed Wire Right-of-way Fence

6.1.2 Security

This type of fence is typically constructed with the intent of fully restricting the passage of domestic animals, wild animals, and humans. Security fences are typically constructed so to be of sufficient height, composition, or design, to eliminate climbing or jumping. Typical heights of fence fabric are 84” or 96”.

Dependent upon the specific site situation and level of security desired, security fences may be topped with one to three strands of barbed wire mounted on 12” vertical post extensions. Post extensions are either mounted vertical or angled away from the railroad operation to further limit potential access by climbing.

Protection of high valued installations, such as railroad material and equipment storage areas, and railroad intermodal or automotive handling facilities may also warrant the inclusion of barrier tape, also commonly referred to as ‘razor-wire’. Appropriate review of local regulations is suggested before the installation of this material in areas potentially accessible to the public, or in areas where employees could routinely be in a position of contact with the barrier tape.

Design of security fence installations should also consider the potential unauthorized access by cutting, climbing, or passing under the fence. Certain steel fence fabric designs are specifically engineered to minimize the ability to cut the fabric with common tools. Likewise, certain types of welded wire fencing are designed to prevent climbing by making hand and foothold difficult to maintain. Unauthorized access by passing under the fence may be reduced by permanently affixing the fence fabric to horizontal support members at the base of the fence to reduce fence flexibility, by placing the fence directly on a paved or heavily stoned surface, or by partially burying the base of the fence.

Climbing of security fences can also be made more difficult through the utilization of tension wires in lieu of a fixed top member between vertical posts.

Security fence may serve a dual role by also demarking a property boundary. If this is the case, the above recommendations on placement found under ‘Right-of-way’ fence should be considered.

Gates in security fences should be so configured to open away from the track whenever possible or be configured with positive stops to prevent the ability for a gate in the non-closed position to foul the railroad clearance envelope. If a gate is installed at an at-grade private vehicle crossing, consideration of the gate’s position relative to the track, and reasonably anticipated operational practice of the user should be considered to avoid placing a vehicle in the foul of the railroad clearance envelope while a vehicle operator attempts to open or close the gate.

Consideration should also be given to the placement of gates in security fences so they are configured to open in the direction that would provide maximum protection for the intended use. In areas where it is desirable to keep non-authorized parties out, outward opening gates are preferable. Likewise, if there is a potential for vehicles or equipment to be illegally taken out of the secured site by non-authorized parties, inward opening gates are preferable. Appropriately fixed stops should be installed to restrict unintended gate motion.

The following photographs provide typical examples of Security fencing;

Exhibit 5 - Chain link Security Fence

Exhibit 6 - Chain link Security Fence with 3 strand barbed wire on single arm

Exhibit 7 - Chain link Security Fence with 6 strand barbed wire on dual arms

Exhibit 8 - Chain link Security Fence with 3 strand barbed wire and barrier tape

Exhibit 9 - Chain link Security Fence pedestrian gate

Exhibit 10 - Chain link Security Fence double swing gate in a track application

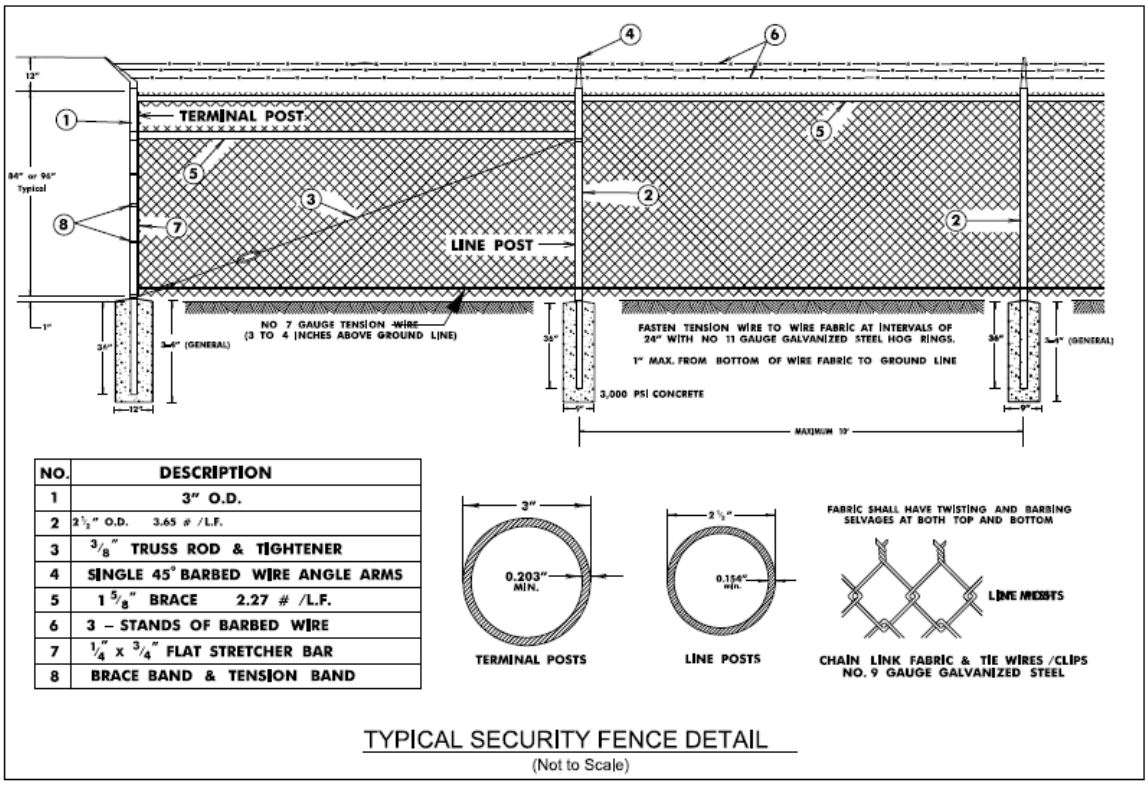


Exhibit 11 - Representative design plan for a Security Fence

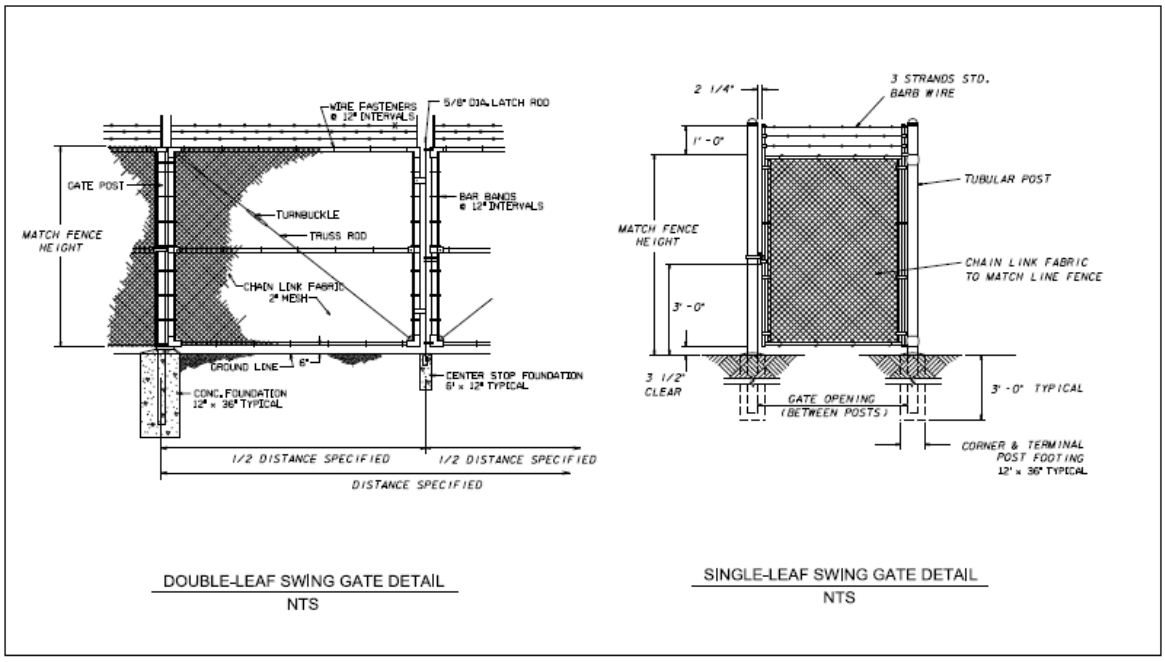


Exhibit 12 - Representative design plans for a Double Swing Gate and Pedestrian Gate in a Security Fence.

6.1.3 Temporary Barrier Fence.

This type of fence is typically installed on a non-permanent basis to separate construction activities from active railroad operations or to physically keep personnel from inadvertently accessing the track zone or worksite hazards. Temporary barrier fencing is also frequently used to demark areas of work sites that cannot be disturbed such as buried utility corridors or environmental resources that must be preserved. The need or use of temporary fencing is highly site-specific. When used in the vicinity of the railroad track, placement must take in to account the nature of the work, Roadway Worker Protection requirements, and the acceptable railroad clearance envelope. Temporary barrier fence may be made from a variety of materials, but is typically colored in a highly visible manner.

Temporary barrier fences should be installed in compliance with worksite safety guidelines. Fence posts and fence fabric ties should be capped and/or positioned so to minimize employee exposure to sharp surfaces. Temporary barrier fence installations should be regularly inspected to ensure that work activities have not altered the intended placement in a negative manner.

The following photograph provides a typical example of a Temporary Barrier Fence.

Exhibit 13 - Temporary Barrier Fence

6.1.4 Permanent Barrier Fence

This type of fence includes cable barriers, tubular steel swing gates, cast-in-place or precast concrete 'Jersey' type barrier wall, and highway guardrail.

Typical uses are to prohibit ingress on to the railroad operating right-of-way from adjacent public and private roadways terminating at RFTA's corridor, perpendicular pedestrian at-grade crossings, and perpendicular highway at-grade crossings. If a guardrail is used as a permanent barrier to vehicular access the post spacing should be reduced to approximately 36" on center to limit access by small all-terrain vehicles.

If small diameter cable or tubular steel barriers are utilized, they should be brightly painted, covered with a highly visible sleeve, or flagged with highly visible signage to increase visibility. Care must be taken when installing these types of barriers so to not create a potential decapitation hazard. Posts for such installations should be positioned to be clear of approved railway clearance envelope so that a close clearance situation is not created. When appropriate a diagonal brace may be positioned from the gate post toward the ballast line to limit the ability of small all-terrain vehicles from using the ballast shoulder as a gate bypass.

Barrier elements that are reasonable movable should have keeper devices with locks, to prevent non-authorized parties from moving them to a position that could impact railroad operations or imperil employees.

If a tubular steel gate is utilized, consideration of the gate and keeper post position in relation to the track must be considered so not to conflict with the railroad clearance envelope. In addition, the position of the keeper post should be located so that Roadway Workers remain clear of the track zone when unlocking the gate.

When a gate is installed at an access point to RFTA's right-of-way near an at-grade vehicle crossing, consideration of the gate's position relative to the roadway should be considered to avoid placing a typical using vehicle in the foul of the roadway while an employee is either opening or closing of the gate.

The following photographs provide typical examples of various types of Permanent Barrier Fences.

Exhibit 14 - Concrete 'Jersey' Barrier

Exhibit 15 - Guard Rail

Exhibit 16 – Rotating Steel Barrier / Crash Gate (double panel configuration)

Exhibit 17 - Cable Right-of-way Barrier Gate

Exhibit 18 – Tubular Steel Right-of-way Barrier Gate

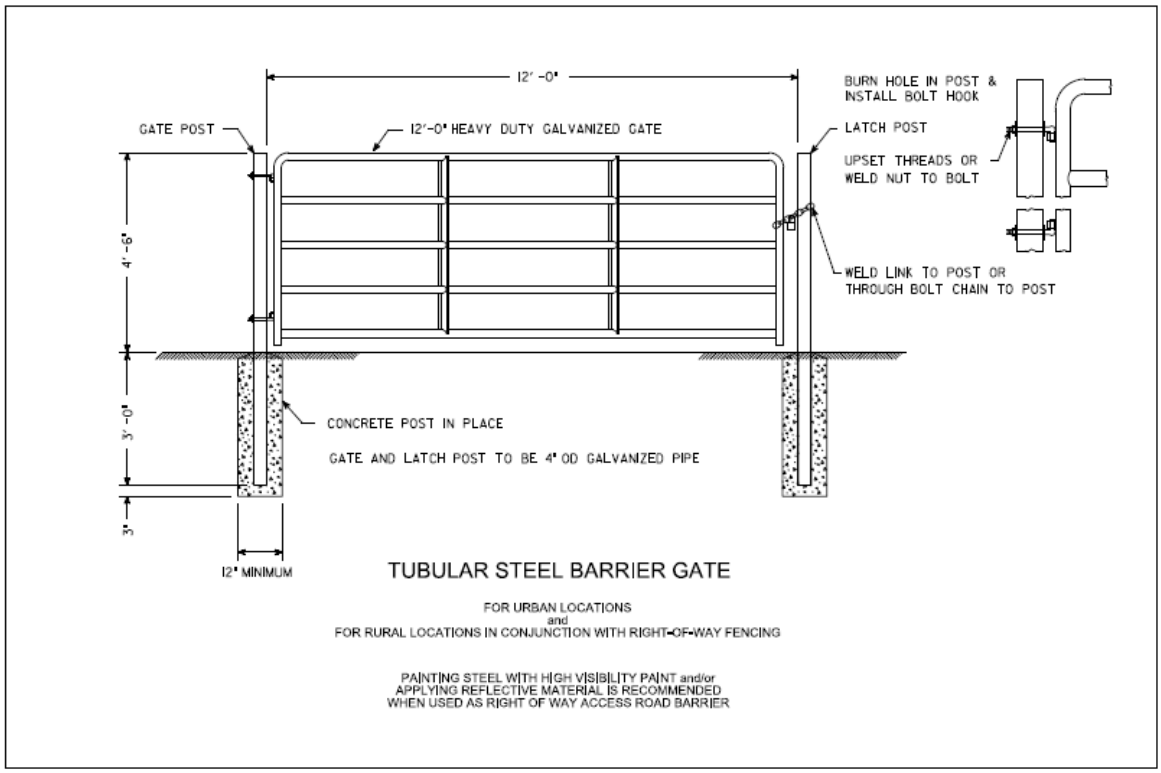


Exhibit 19 - Representative design plan for a Tubular Barrier Gate

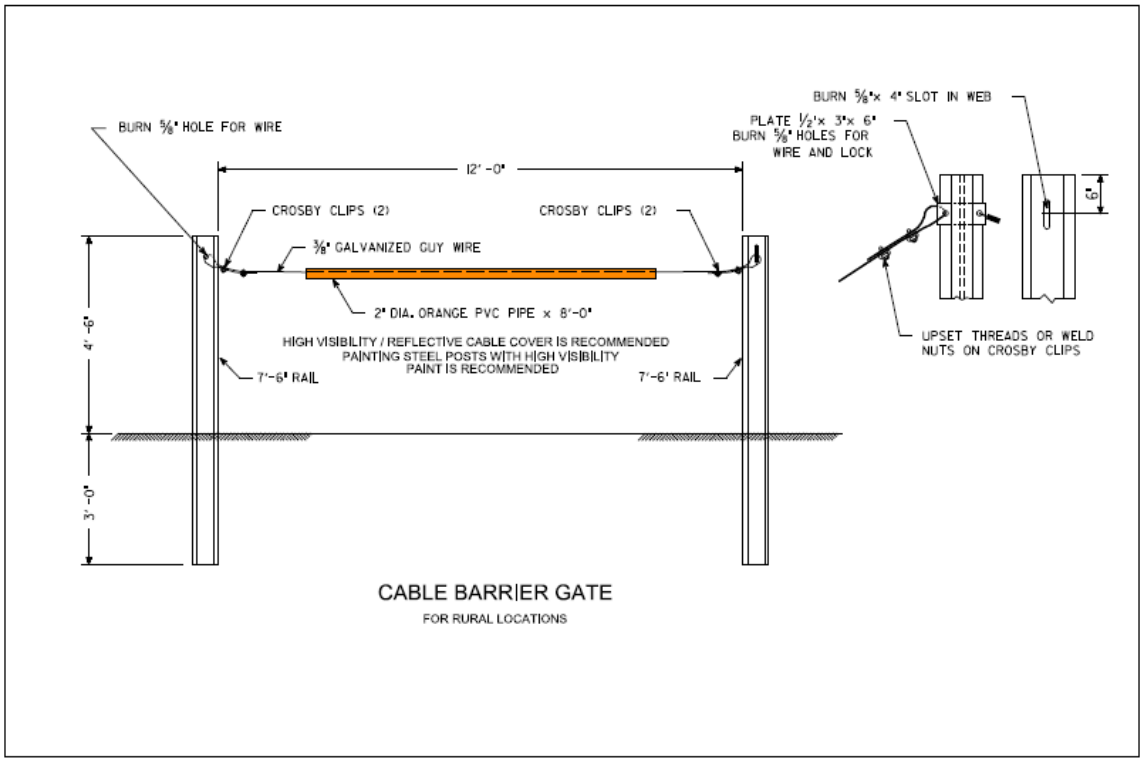


Exhibit 20 - Representative design plan for a Cable Barrier Gate

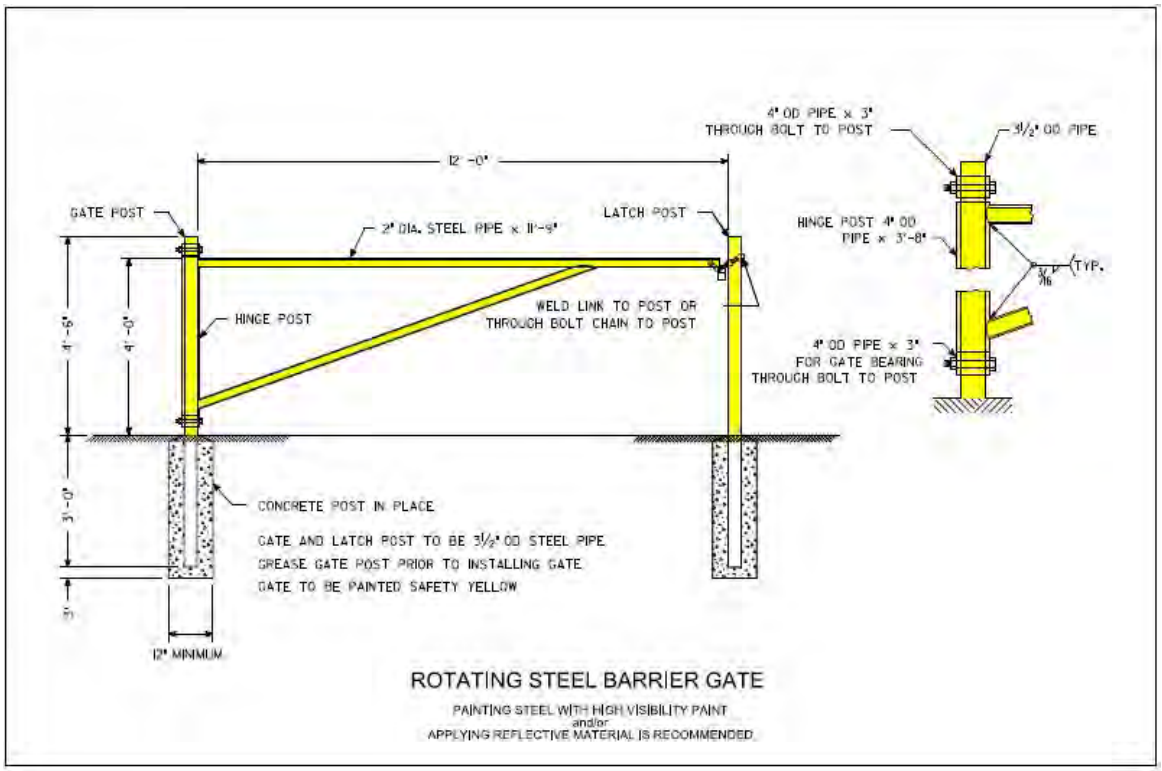


Exhibit 21 - Representative design plan for a Steel Barrier Gate

6.1.5 Pedestrian Barrier Fence for Platform Areas

This type of fence includes various types of low-height woven steel, welded-steel, welded-wire, and tubular steel fencing, that are typically installed parallel to the railroad track between tracks in passenger station areas to deter passengers from attempting to cross active tracks to reach adjacent platforms, station waiting areas, or parking lots. Typical heights are 48".

Typical uses may also include placement perpendicular to the railroad track at the ends of platforms, and adjacent to public and private roadway crossings or pedestrian grade crossings near platform areas, to restrict ingress to unauthorized portions of RFTA's operating right-of-way.

This type of fence installation is highly site specific, and must take into consideration the railroad track centerline spacing, and the railroad clearance envelope. Intertrack fences adjacent platforms are commonly extended 100' beyond the end of the accessible passenger platform area.

Fence design for areas between tracks should also consider track maintenance activities. Design considerations might include panelized construction that enables temporary removal, or vertical posts assemblies that can pivot, enabling the fence to be temporarily lowered to a horizontal position away from the work activities. Any potentially removable elements, or pivoting posts should be constructed to include keepers or mechanical locking devices to keep fence in normal position unless track work is being performed.

For installations parallel to the track, the placement of 'Close Clearance' signage perpendicular to the track at each end of the installation to warn railroad employees, and "Do Not Cross Track" signage facing the platform(s) to warn the public should be considered and installed as appropriate for the situation. A review of legal requirements for warning signage is recommended to ensure compliance with appropriate regulations that may exist.

The following photographs provide typical examples of a Pedestrian Barrier Fences.

Exhibit 22 - Center of Track Barrier

Exhibit 22 - End of Platform Barrier – note setback from platform edge.

6.1.6 Sand and Snow Fence

Please refer to AREMA Manual Chapter 1.6 – Roadway/Fences for information and detail for design and placement of sand and snow fences on or adjacent to RFTA's property.

6.2 Design Considerations (2014)

When a new installation is proposed, the fence design should be appropriate for the intended use, site topography, climate, and availability of long-term maintenance.

6.3 Material Selections Considerations (2014)

Materials should be selected for appropriateness of durability, cost effectiveness, availability. Forethought should be given to installation restrictions, as well as the long-term potential for damage from routine railroad maintenance activities or outside parties. The potential for theft of the material should also be considered.

Typical fence posts materials are galvanized or painted metal, preservative or pressure treated wooden, and concrete. Metal posts for right-of-way fences are typically rolled T, U, Y, or Channel sections, however hollow steel tubing is commonly used for security and general barrier fencing. Dependent upon the type of fence being constructed, treated timber, concrete, and fiber composites posts may also be utilized for both line and brace applications.

The selection of fabric type should be appropriate for the type of fence to be constructed. Typical fence fabric materials are woven wire, welded wire, and barb wire. High tensile steel is recommended as the base material. Polyethylene fence fabric is commonly used for temporary barrier applications and Polypropylene mesh fence fabric may be appropriate for specific wild life control applications.

The best source of information on specific materials are the current standard plans and specifications of the Operating Railroads, the appropriate State Department of Transportation standard plans and specifications, or plans and specifications of other appropriate local governing agencies.

6.4 Other Fence Components and Specialty Applications (2014)

Cattle Guards are devices that are placed in line with the fence, perpendicular to the railroad to enable open range fence lines to cross railroad track. The surface of the track zone or vehicular passage area is comprised of open-spaced steel angle, tubes, or wide aperture serrated grates which create an irregular surface that most domesticated herd animals will not willingly cross.

The devices may also be utilized at points in right-of-way fence lines parallel to the railroad track where road crossings bisect the fence line and a gate is inappropriate. Examples would be high usage roadways approaching track in open range, or points where vehicular traffic could not safely stop to open or secure a line gate.

In-track Cattle Guards can be constructed from a variety of materials, with a general consideration being adequate clearance for passage rail equipment.

Exhibit 26 – In-Track Cattle Guard

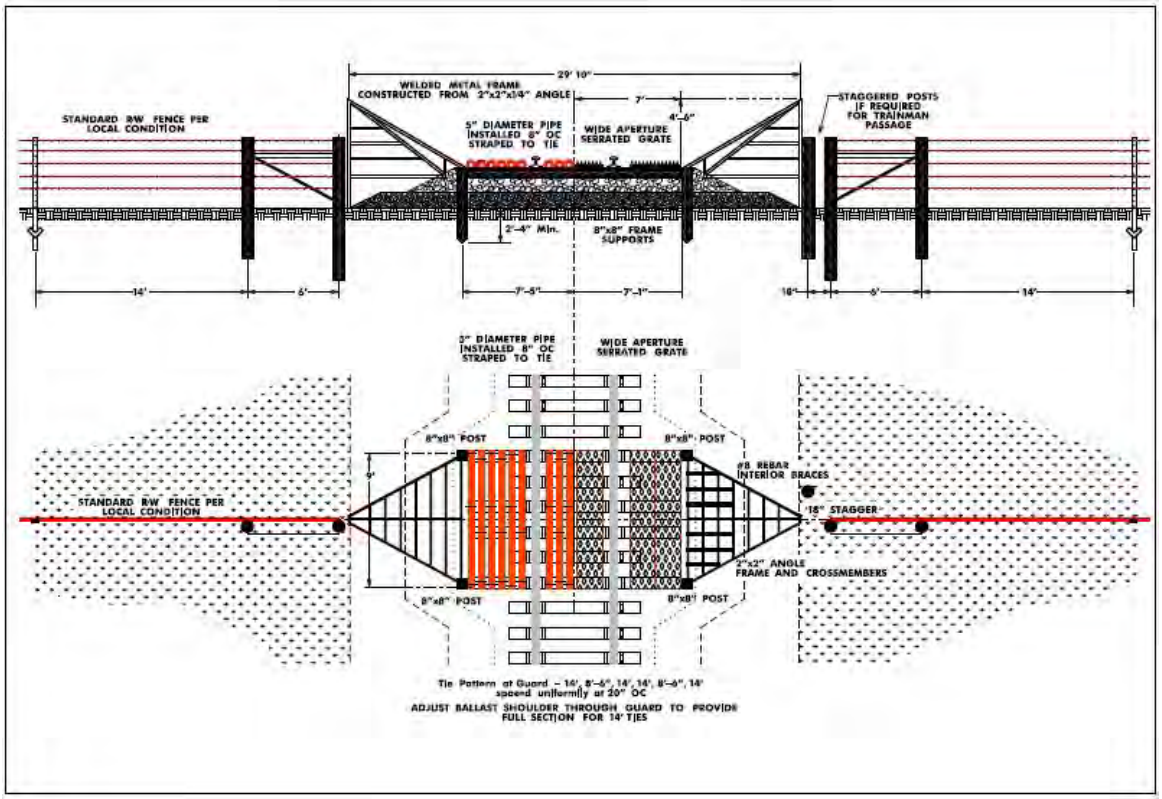
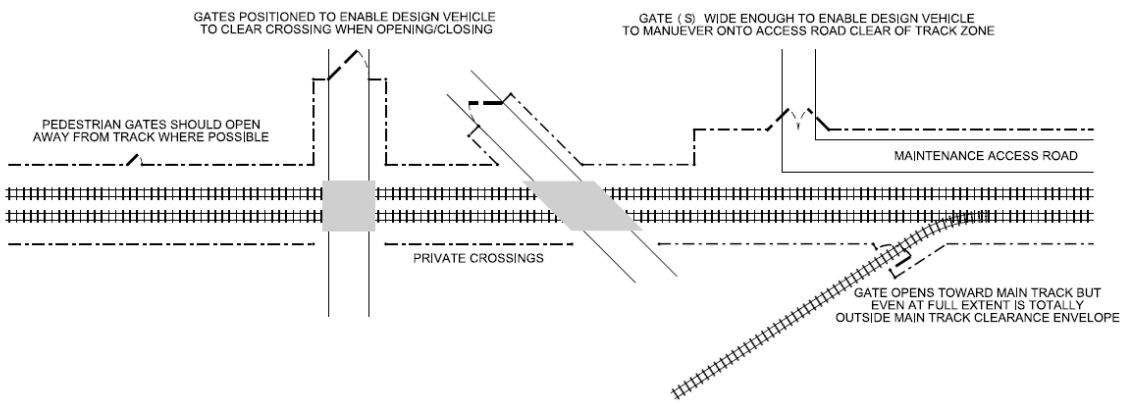


Exhibit 27 – Representative Design of an In-Track Cattle Guard

Line Gates serve to enable ingress or egress from a fenced area. They are typically fabricated from materials either matching that used in the fence line, or from materials that are compatible with the purpose of the fence line. Gates typically are of a swing type, but may be of sliding or vertical lift design. Gates should have an effective hasp so they may be secured in a closed position and are typically equipped with a lock. Dependent upon the length required opening, and material being used, gates may be one or two pieces. When used adjacent to and parallel to railroad tracks it is preferable for a gate to open away from the track.



PLACEMENT OF LINE GATES RELATIVE TO TRACK

Exhibit 28 – Arrangement of Line Gates within Track Zone.

When Line Gates are used to control access to facilities or industries, and must perpendicularly cross tracks, specific considerations must be made. A primary consideration would be compliance with all applicable horizontal clearance requirements from the centerline of track. Secondarily, consideration must be given to maintaining the integrity of the security fence line as it crosses the track and roadbed section. Cross track gates may be fabricated to include a cross-sectional profile that matches the track and roadbed cross-section, or the roadbed may be adapted to ensure continuity of the fence line. Stone, Concrete, Asphalt, concrete, compacted Dense Grade Aggregate, or timbers may be used to limit under fence ingress/egress due to the roadbed section.

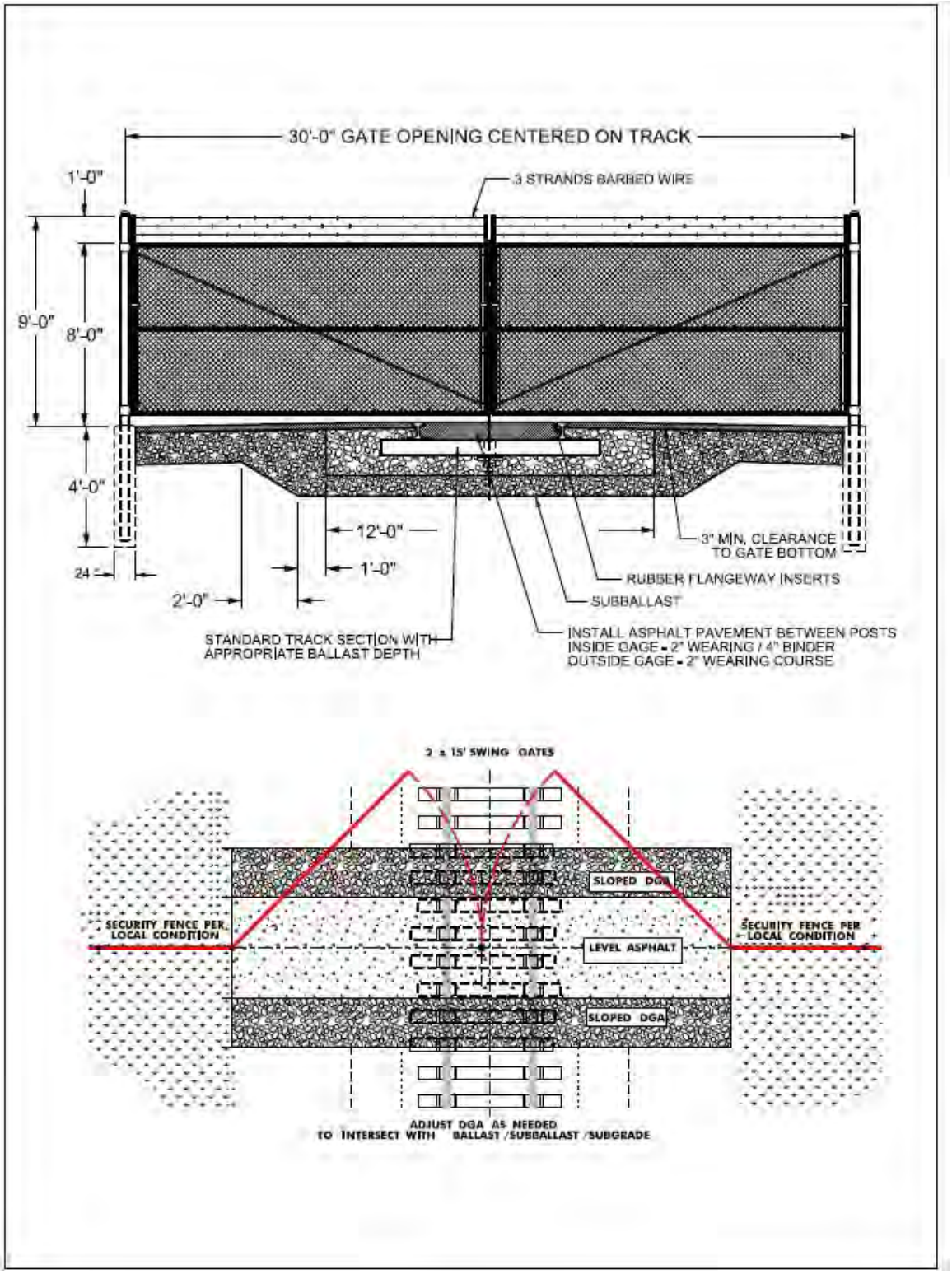


Exhibit 29 - Representative design plan for a security type Line Gate in a cross-track application that conforms to the Roadbed Section.

Flow Gates are sections of fence designed to accommodate drainage ways. They are typically found in parallel right-of-way fences that are serving to limit the movement of domestic animals into or through drainage culverts or underpasses.

Flow Gates are particularly useful when the drainage way handles a varying amount of flow, or is only seasonally active. The ability to maintain the Flow Gate and clear drift from the Flow Gate as it accumulates should be considered so that the intended operation of railroad drainage structure is not impacted.

Common designs include free moving wooden cross-members or float barrels suspended directly from the line fence, or suspended from a secure carrier wire positioned at the base of the line fence. Properly anchoring the line fence adjacent the water way is an important design consideration.

Exhibit 30 - Flow Gate

Decorative Fencing may be appropriate for locations where the security or barrier functions of a fence are desired but a more refined aesthetic appearance is needed. This type of fencing is available in a great variety of styles, and can also easily adapted for security purposes by including non-climbable design elements.

Exhibit 29a - Decorative Fencing in a Right-of-Way demarcation application

Exhibit 29b – Decorative Fencing application in vicinity of at grade road crossing

Exhibit 29c – Decorative Fencing used a wall top treatment in an urban setting

Exhibit 30 – Overhead Bridge Fencing using Decorative Finish chain-link product.

Abutment Barriers are sections of fencing or permanently affixed barriers used to protect personnel who may be working on the ground or traversing maintenance roads parallel to the track in the proximity of an open bridge abutment.

Common applications are at locations where a bridge span may have been removed, leaving a gap in the graded ground surface. They may are also be used to denote wing-walls, or other locations where the presence of a potential fall hazard exists and may not be readily visible.

It is recommended that such barriers be painted in a highly visible manner and that cross-members be sized and positioned so not to create a decapitation hazard.

Exhibit 31 – Abutment Barrier

11.0 Survey Standard

All projects and agreements tied to fixed improvements must be surveyed and tied to RFTA's survey control network. Copies of RFTA's Land Survey Plats and Control Diagrams reside in the Clerk and Recorder's offices of Garfield, Eagle, and Pitkin counties.

All exhibits submitted to RFTA must be tied to at least two RFTA Survey corridor R/W monuments plus either one of RFTA Control Monuments #1-10 or one of any published NGS monument to verify the location in RFTA's state plane coordinate and vertical elevation datum, brought to ground level (not left at the surface of the Geoid.)

Datum: NAD '83 (1992) Colorado State Plane Coordinate System – Central Zone (Modified to ground typically by a factor of 1.00035556); Vertical Datum = NAVD '88

When assembling exhibits, drawings, and plats for RFTA approval and comment, those exhibits, drawings, and plats must show the above datum or conversion instructions to obtain RFTA datum.

Exhibits and Plats Submitted to RFTA:

(1) Must be submitted to RFTA in paper and .pdf file format (Standard sizes) and digital format drawing file format (dwg or dgn noting software version and note pen configuration/pen style /plotter configuration.
The drawing shall

include:

- ties to RFTA Control Network
- North arrow orientation
- Scale
- Facility to be added or modified (clarity in graphics a must)
- Old Railroad Engineering Profile Stationing and Milepost Location (Decimal or Milepost plus feet) where possible
- A written description of what to be added, modified or removed (nature of work)
- Directions to nearest stations or incorporated villages/cities/towns
- Clearances (horizontal & vertical) to RFTA centerline and profiles plus existing trackage
- Crossing angle of centerline or right of way line in relation to improvement where possible.
- Location of bore pits and other temporary improvements if known

(2) Unless stated elsewhere, drawing sizes must be legible at 11" x 17" for duplication by standard office copy machines and printers. (not large format).

(3) Drawings and survey must meet national map standard accuracy requirements or be labeled as a sketch or schematic.4.7

Section 12.0 References

California GO-118 Walkway Regulation (Base Document):
http://docs.cpuc.ca.gov/word_pdf/general_order/go118.pdf

Colorado Clearance Regulations (4CCR723-7):
www.dora.state.co.us/puc%20/rules/723-7.doc

Union Pacific Typical Trackwork standard plans:
http://www.uprr.com/aboutup/operations/specs/track/index.shtml

Pipeline & Hazardous Material Safety:
www.phmsa.dot.gov/regulations & www.phmsa.dot.gov/pipeline

AASHTO Policy Guidelines:
http://www.youtube.com/watch?v=UwKeFVfkbtc
https://bookstore.transportation.org/item_details.aspx?id=2215 = Streets & Highways
https://bookstore.transportation.org/collection_detail.aspx?ID=116 = Bicycle & Trail Facilities
https://bookstore.transportation.org/collection_detail.aspx?ID=131 = Pedestrian Facilities

AREMA MANUAL: https://www.arema.org/publications/mre/index.aspx

Union Pacific / BNSF Grade Separation Manual
www.uprr.com/aboutup/operations/specs/attachments/grade_separation.pdf

National Electrical Code:
http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=70

NUCA/ National Underground Contractors Association / Damage Prevention: http://nuca.com/

UNCC – Colorado Underground Notification System: http://colorado811.org/web/guest/home